THE IRON AGE

THURSDAY, SEPTEMBER 11, 1902.

The German Electrical Industry.

In our last issue was presented part of a report by Consul-General Frank H. Mason on the condition of the German electrical industry, as shown by the catastrophe in the Schuckert Electrical Company. The concluding paragraphs of the report are as follows:

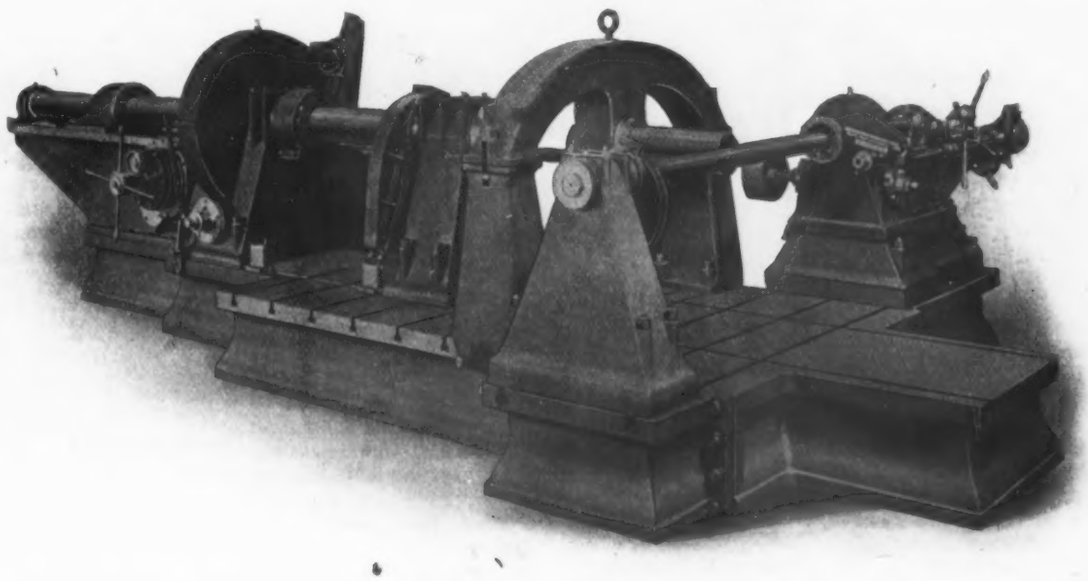
Another heavy blow for some of the German electrical manufacturing companies has been the failure of the storage battery traction system for tramways, which is now conceded to be practically hopeless. When electric traction was introduced into this country municipal governments were timid and hesitating. They objected to the overhead conductor because it was considered unsightly and dangerous, and in order to obtain any franchise at all the tramway companies and the electrical manufacturers who were behind them had to agree to furnish cars that would dispense with a visible trolley. This meant either the underground conduit system—which is so expensive to construct as to be justified only by an enormous traffic—or a reliance upon storage batteries, and the companies generally had recourse to the latter. The extent to which this has been done may be inferred from the fact that one company in Hanover have at present 274 accumulator cars in service. There, as at Halle, Hagen and many other places, they have been found so heavy, costly and subject to explosions as to be unremunerative. At Berlin, where many hundreds of them have been in service, all are to be abandoned and recourse had to underground conductors for centrally located streets and overhead wires for the less crowded and suburban sections.

The net result of all these conditions was that some of the electrical manufacturing companies of Germany which had gone on organizing and supplying power, lighting, carbide and other plants, not only at home but in Russia, Scandinavia, Austria-Hungary and other European countries, were caught with all sail spread by the turning tide and adverse gale that set in during the summer of 1900. In the stormy weather that ensued most industrial stocks declined sharply, the investing public became alarmed and timid, the failures of the Leipziger and other banks followed a few months later and led on to the situation of which the meeting of last week at Nuremberg has been the ultimate result.

The encouraging features of the present condition are the fact that the credit of several of the oldest and strongest of the electrical companies remains unshaken, the general feeling that the bottom has been reached, that the obligations entailed by a system of forced development have been mostly liquidated, and that with the good cereal crops that will be harvested this year, peace throughout the world and the hoped for renewal of the commercial treaties which are to lapse next year, the foundation will be laid for a renewed and enduring prosperity.

The Barrett Double Bar Cylinder Boring Machine.

The Barrett double bar cylinder boring machine built by the Meadville Vise Company of Meadville, Pa., is designed for boring cylinders, also for boring the guides of frames and facing off the end of bed. It will also machine pillow blocks and face both inside and outside of boxes at the same time. All four operations can be done at the same time and at one setting, and perfect alignment is assured.



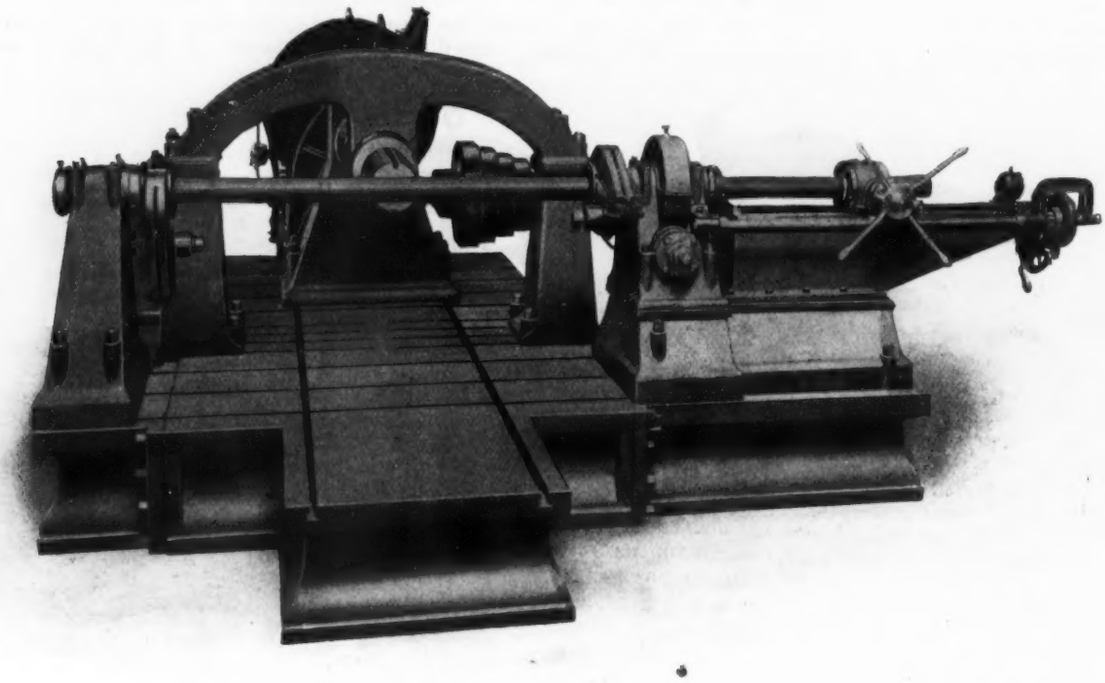
THE BARRETT DOUBLE BAR CYLINDER BORING MACHINE.

It is composed of two independent boring mills mounted upon the same bed and arranged with the boring bars at right angles with each other.

The large machine has a flat platen bed 20 feet 8 inches long, 6 feet wide and 18 inches high. The pedestals are 32 inches from the top of the bed to the center of the boring bar. The machine has a continuous feed travel in either direction of 60 inches. It is driven by the Albro worm and worm gear, geared 85 to 1. It is equipped with the company's patented variable feed device, which has 12 different feeds, ranging from 1-32 to ⅞ inch. The boring bar is 8 inches in diameter and made of hammered steel and has a quick travel in either direction by power, and the operator is not compelled to pull it in and out of the cylinder by hand, although it can be handled by hand when so desired. The hubs of the facing arms are split and provided with two collar bolts for tightening the arms to the outside of the sleeves. When tools are adjusted and it is desired to start the facing arms it is only necessary to tighten up on the collar bolts and this will put the arms in motion. When the arms are not in use collar bolts are released and the

sleeves will revolve on the bar. These facing arms are provided with a sliding block that travels at right angles with the boring bar. This sliding block is fed in and out with star feed. Mounted upon this is a sliding block, made on top in cylindrical form, which receives a steel plunger for holding the tool. This plunger has a horizontal motion of 2½ inches for the convenience of adjusting tools and turning off the outside flanges of cylinders. In the center of the plunger is the hole for holding the tool. This tool is held in position by a set screw. The quadrant can be turned on the first block to any desired position. The yoke shown in both cuts is for supporting the end of the bar when boring the guides of frames. In this case the tail pedestal is removed entirely from the bed.

The small or cross boring machine, Fig. 2, is used for boring out pillow blocks and will open up to 60 inches, and as both tail pedestal and head stock are adjustable on the bed they can be closed up to 20 inches. This machine is equipped with facing arms, same style as on the large machine, for facing off the outside edge of pillow blocks. A small portable arm is clamped on the bar for facing the inside of the pillow blocks. The boring bar is 3¾ inches in diameter and made of hammered steel. The machine has a continuous feed travel in either direction of 36 inches, and is driven by the Albro worm and worm gear, geared 45 to 1. Weight of machine, 36,000 pounds.



THE BARRETT DOUBLE BAR CYLINDER BORING MACHINE.

The National Railway Master Blacksmiths' Association in Convention.

At the tenth annual convention of the National Railway Master Blacksmiths' Association, held in Chicago on August 19 and 20, some interesting and valuable papers were read and discussed by the members present.

One of the most interesting resolutions which was adopted by the convention is as follows: "Steel is preferable to iron for direct compression or tensile strains; for all members of cars or locomotives that are subjected to vibrating strains or sudden shocks good iron is preferable."

Another resolution which was offered by W. C. Kroegher, and which was adopted, is as follows: "*Resolved*, That this association put itself on record as being opposed to welding steel that is over 0.65 per cent. carbon." Earlier in the proceedings Col. H. Jeffrey had said that he would weld steel and guarantee it. These remarks and the resolutions above given were preceded by and resulted from the reading of a paper on the subject, "Uniform Methods of Reducing Blacksmithing to an Exact Science."

The second topic of discussion was "A Clean Shop; Does It Pay?" The subject was presented by a committee of which A. W. McCasslin was chairman.

"Case Hardening" was reported upon by a committee of which O. W. Hodgetts was chairman. An animated discussion followed as to the time required for case hardening, Chairman Hodgetts having stated in his paper that only about six hours are required for his class of work. A number of others claimed that it requires from 15 to 18 hours.

At the second day's session "Fuel Welding" was taken up, an interesting paper being read by T. J. Riggs of Pennsylvania, with illustrations showing method and devices used in such work.

The topic, "Waste of Coal," which was to have been considered at this meeting, was postponed until the gathering in 1903.

"Frogs and Crossings" was the subject of a paper by J. G. Jordan of the Southern Pacific Railway. W. E. Jones of the Northern Pacific Railway and O. B. Judy of the Vandalia Line also read papers on the same subject.

"Track Tools" was the title of a subject reported upon by a committee and signed by J. H. Hughes and T. J. Frederickson. The discussion which followed the reading of the paper centered upon the class of steel which is regarded as the most practical for track tools.

"Tools and Tool Steel" was reported upon by a committee, Benjamin Burgess, chairman. A number of steel companies' representatives who were present at the meeting were especially interested in the views expressed on this subject.

"Springs; Making and Repairing" was considered in a paper presentd by a committee of which C. A. Miller was chairman.

"The Oil Furnace; Best Form" was the title of a paper presented by S. G. Little of the Santa Fé Railroad. Much interest was exhibited by all present, and many were the questions asked by the delegates. President Savage predicted that the time is coming when the oil forge will be used. T. C. Lace held that oil is impracticable for forges because of the close proximity of the fuel to the material to be heated. Mr. Hinkens claimed that oil forges are in service in Russia and found of practical utility.

The following officers were chosen for the ensuing year: President, John McNally, C. & N. W. Railway, Chicago; first vice-president, George Lindsay, E. & T. H. Railway, Evansville, Ind.; second vice-president, Thos. F. Keane of Ramapo Iron Works, Hillburn, N. Y.; secretary and treasurer, A. L. Woodworth, C., H. & D. Railway, Lima, Ohio; chief chemist, George H. Williams of B. M. Jones & Co., Boston, Mass.

The secretary reported that the membership of the association had been increased by 41 duing the year, the greatest increase of any one year in the history of the association. There are now 302 members enrolled. The treasurer reported a surplus of $315.17.

After the convention the members were guests of the Illinois Central Railway and visited the Illinois Steel Company, the Illinois Central and other Pullman shops.

One of the pleasant surprises and side lights of the occasion was the presentation of a gold watch and chain to Col. G. H. Williams, chief chemist. The presentation was made by Arthur J. O'Leary of Chicago. The next annual meeting will be held at Buffalo, N. Y.

Tools and Tool Steel.

The following is the report of the Committee on Tools and Tool Steel read before the recent convention of the National Railroad Master Blacksmiths' Association, signed by B. Burgess and C. Nelson, committeemen:

The subject is a very broad one and has been before the past conventions in one form or another every year. This goes to show to some extent the importance of the subject at hand. The best talent our association affords has been devoted to this line of inquiry, so that our past reports contain a great amount of information on this very important subject, and there is not any branch of our business that presents so much that is fascinating, interesting, mysterious and contradictory.

Tools.—Under this head are included all tools brought to the toolsmith to be made, dressed or repaired.

We will not attempt to describe how tools for lathe, planer, slotter, &c., ought to be made. It is plain, however, that there is a right and a wrong way, a proper form for every tool, a correct angle, amount of clearance, &c. This we leave to the machinist to determine, and the toolsmith soon finds out that machinists, as well as doctors, differ. Therefore we hail with pleasure some system with grinding machines that will grind at the proper angle, exact amount of clearance, and the tool dresser furnished with sample tools and forms; this will fill a long felt want. For the past 15 years or more we have been making our shear blades with cutting edges square instead of beveled, with good results. When one side gets dull we simply turn round the blade. This gives the second cutting edge, and when this gets dull turn the blade upside down. This gives the third cutting edge. When this gets dull turn round again and you have the fourth cutting edge. All that is necessary is to have the holes in blade central and countersunk on both sides.

Crucible or Carbon Steel.—We recommend these grades: Select for lathe, planer, slotter, screw cutting, dies, &c.; second grade for chipping chisels, hammers, &c., that have to withstand shock, and the third grade for hot punches, fullers, flatters, setts, &c. Your experience coupled with good judgment will prove the best guide for selecting the best steel for the purpose to which tool is to be applied.

How are we to get the best results from this wonderful metal with the different modes of treatment? Here are a few simple rules on which nearly all are agreed and which must be followed to insure success: Select a good steel for the purpose for which the tool is intended; have a clean fire, a deep body of fuel to prevent the cold blast from getting through; heat slowly and thoroughly; use judgment in forging, turning the steel steel over and upside down frequently; see that your anvil is nice and smooth and never try to temper on the same heat for forging unless it be a track pick. For machine tools, after forging, to shape, lay aside till cold, then reheat as above in a clean, deep, bright fire slowly and thoroughly, not any higher than is necessary to get the necessary hardness; then dip in your cooling bath. For lathes, planers, &c., we do not think it is good policy to draw temper; a little practice with dipping will be found as satisfactory and more so.

We all know color stands for nothing unless the necessary hardness is first placed there; that a bright piece of steel in its natural state or even a piece of iron will show color just as well as hardened steel, and the probability is you will get as uniform a temper by dipping as by drawing. We have purposely avoided calling these different degrees of heat red, full red, dull red, cherry red, &c., as being too indefinite; only the man behind the anvil with experience and good judgment knows what these heats are. The artistic part of this business must be acquired and cannot be taught.

It will be noticed there is much here that is very indefinite. The heat for hardening is indefinite, because the eye, wonderful organ though it be, has its limit and cannot register the degree of heat. Let us look on while a large reamer or tap is being hardened in the good old way. After getting by the eye the proper heat it is removed and immersed in the cooling medium. There was, perhaps, from half an hour to three hours, according to the size of the tool, allowed to bring this tool to proper heat; this was to allow the grain or particles of steel to get into proper position for the coming battle. The tool is gradually lowered, the water boils with the intense heat, we notice small scales of iron or steel that are on the surface of the water are sometimes attracted and then repelled.

Gradually the water becomes calm, the vibrations cease, no crack has been felt; on withdrawing from the water it is found just about right; another good tool is added to the tool room. Now who can tell what changes in the meantime have taken place while this process of refining was going on? This is tempering by sight.

In tempering by science the first thing we want is a good grade of steel and a knowledge of its contents. How are we going to find this out? By experience and testing. Now we want a good heating furnace for steel, one that is slow and steady, with a pyrometer to register the degrees of heat. Raise your furnace until it reaches the degree of heat wanted, hold there until you are certain your steel is thoroughly heated through, immerse in your cooling liquid and your job is completed.

It will be noticed there is no guess work about this. The eye may be deceived but you are governed by laws that are absolute, and every day, whether dull or bright, the results will be exactly the same. This may be called tempering by science, and when everything is properly adjusted any one can do the tempering. In this case there is no drawing to temper, there is no drawing necessary, you know you have the exact degree of hardness required. Such a plant is only practical and is best adapted for large quantities, and for railroad shops generally may not be a necessity; but the way railroads are being merged the day is not far distant when such a plant for tempering will be a necessity in all large shops.

For extremely hard work self hardening steel has taken a prominent place and so far is maintaining it. Of late different modes of treatment have been recommended; the burning process is beneficial to some brands, while to others it proves detrimental. High priced steel is being placed on the market, machines are being speeded faster and faster all the time, everything along this line seems to be in a state of transition. It is evident, therefore, that nothing but the best grades of steel will prove satisfactory.

In conclusion we have confined ourselves to a strictly practical basis. The field is wide and limitless, the possibilities are great. We believe the steel question with different lines of treatment will continue to thrust itself forward for recognition until we receive from the manufacturers an article that will be practically perfect.

We have no experience with local treatment of steel. We hope some of our members will be able to throw some light along this line.

Steel is being put on the market that is seemingly high priced, but if we can increase the amount of work from 30 to 60 per cent., then the price of steel is a very small item. The days of cheap steel are numbered, and those in authority that will only buy a cheap grade of steel will simply be relegated to the rear.

The Commerce of the Philippine Islands.

WASHINGTON, D. C., September 8, 1902.—The Bureau of Insular Affairs of the War Department has prepared a statistical review of the commerce of the Philippine Islands for the year 1901, as compared with 1900 and 1899, which shows a determined effort on the part of the commercial world at large to invade the industrial field afforded by the islands. While American manufacturers have made a creditable showing in their effort to secure a foothold in territory to which they had paid little attention prior to the Spanish War, they have as yet obtained only a fraction of the import trade of the islands, the value of which has risen in the past three years from $19,000,000 to more than $30,000,000, while the export trade has grown from $15,000,000 to $25,000,000.

Our Share of Trade Larger than Appears.

In considering the share of the United States in the import trade of the Philippines the fact must be borne in mind that these statistics relate exclusively to goods which are duly entered and passed through the Philippine custom houses, but do not include supplies imported by the United States Government for the use of the Army, Navy, Marine Hospital Service, or by the Insular Government for its use or that of its subordinate branches. For example, the Manila ice plant, costing in the neighborhood of $1,000,000; the Government printing plant, which cost about $200,000; large supplies for the Department of Public Instruction, were all purchased in the United States, but do not appear in the commerce of the United States with the islands. The Insular Distributing Agent at Washington disburses something like $1,000,000 per annum for the Insular Government, all of which is for merchandise purchased in the United States. The Insular Purchasing Agent at Manila also purchases extensively in the United States as well as in other countries, so that the total volume of trade between the United States and the Philippines is much greater than appears from the statistics.

The total imports into the islands in 1899 were valued at a little more than $19,000,000; in 1900 they rose to nearly $25,000,000, and in 1901 to more than $30,000,000; the increase for 1901 being 57 per cent. over 1899 and more than 21 per cent. over 1900. The exports of the islands in 1899 amounted to $15,000,000; in 1900 to $23,000,000, and in 1901 to nearly $25,000,000. Customs duties on merchandise rose from $4,411,680 in 1899 to $7,700,679 in 1900 and to $8,164,466 in 1901, in spite of the fact that the tariff was materially reduced during the last named year. Under Spanish ownership the customs revenue for several years prior to American occupation averaged a little more than $3,000,000 per annum.

Great Fluctuations in Volume.

It is interesting to note the fluctuations in the volume of trade under the new order of things as regards its distribution. In 1899 the United States supplied 7 per cent. of the imports; in 1900, 9 per cent., and in 1901, 12 per cent.; the United Kingdom, 17, 22 and 18 per cent. for these years, respectively; Spain, 14, 8 and 6 per cent.; Germany, 5, 7 and 7 per cent.; France, 2, 4 and 6 per cent.; China, including Hongkong, 43, 31 and 16 per cent.; British East Indies, 4, 7 and 11 per cent.; Japan, 1, 2 and 4 per cent.; all other countries, 7, 10 and 20 per cent. Quite a large portion of the Philippine trade is via Hongkong, and from reports, especially of exports, it would appear that Hongkong furnishes the archipelago a considerable part of its imports and also a large percentage of its exports. This, however, is not the case, as Hongkong is simply a distributing point, bearing a relation to the Philippine products similar to that of Chicago to the grain crops of Illinois and contiguous States. It has not been found practicable thus far to trace the origin of imports from Hongkong, nor the ultimate destination of exports sent to that point. With the completion of the harbor improvements at Manila, which are now well under way, and with the honest and equitable port charges which are now in vogue, Manila is destined to secure from Hongkong a great part of the trade now controlled by the latter. Manila is by nature located for the distribution of imports and exports of Eastern Asia and Oceania.

For the three years named the United States took 27, 13 and 19 per cent. of the exports respectively; United Kingdom, 24, 35 and 45 per cent.; Germany less than 1 per cent. for each year. France, 3, 11 and 5 per cent.; China, including Hongkong, 27 per cent. in 1899, but in 1900, when exports to Hongkong were first recorded separate from those of China, the latter is discharged with but 1 per cent. and in 1901 less than 1 per cent. of the exports, Hongkong receiving 16 per cent. in 1900 and 12 per cent. in 1901, which would indicate but little actual trade with China in 1899; Spain, 7, 7 and 5 per cent. for the three respective years; Japan, 7, 3 and 6 per cent.; British East Indies, 3, 4 and 3 per cent., and all other countries 1, 9 and 4 per cent. The great increase of exports to the United Kingdom consisted principally of hemp, a large portion of which eventually reached this country; the exports of this article to the United States shows over $1,000,000 increase in 1900 over 1899. While the United States is yet behind certain other countries in the Philippine trade, there has been a great increase in its exports to the islands, which during the last years of Spanish control amounted to an annual average of barely 3 per cent. of the total as compared with 12 per cent. in 1901. The principal articles, in the order of their importance, exported from the United States during the year 1901 were malt liquors, wheat flour, carriages and bicycles, oils, cotton goods, wood and its manufactures, leather and its manufactures and watches and clocks.

In no important class of merchandise has there been a greater ratio of increase than in the imports of iron and steel and their finished forms. In 1901 these imports amounted to $2,032,946, as compared with $1,451,880 in 1900 and $392,730 in 1899. In 1901 the United Kingdom supplied $731,860 worth, or about 36 per cent., while the United States furnished $426,828, or about 21 per cent. Germany supplied $420,000 worth, or almost exactly as much as the United States.

The Imports of Iron and Steel.

Through the courtesy of the Insular Bureau the correspondent of *The Iron Age* has been supplied with the more important details of the imports of iron and steel during 1901, which have not yet been published. From these figures it is seen that while American exporters make but a small showing in crude and partly manufactured materials, they are gaining rapidly in the higher classes of iron and steel products. Of the 1818 tons of pig iron, valued at $19,271, imported in 1901, the United Kingdom furnished 750 tons, while the United States supplied none. Bar iron to the value of $64,922 was imported, the United Kingdom furnishing $46,485 and the United States but $4666. Of the $26,911 worth of iron and steel rods and bars imported the United Kingdom supplied $18,130 and the United States $3843. Iron rails to the value of $21,805 were imported, of which $18,121 came from Germany, $3508 from the United Kingdom, and none from the United States. Steel rails to the value of $4038 were imported, of which the United Kingdom furnished $2393, Germany $1645 and the United States none. A relatively important item was that of iron plates, which were imported during the year to the value of $195,069, the United Kingdom supplying $191,804 and the United States $1446. Of the $40,401 worth of steel plates imported the United States supplied $15,526, the United Kingdom $18,087 and Germany $3581. Of the $37,877 worth of structural iron and steel imported Germany and the United Kingdom supplied about equal quantities, while the United States furnished but a single insignificant item of $4.

The record of American exporters improves, however, in the more highly manufactured classes, as will be seen from the following figures showing the total importations of the items and the share of the United States: Wire cables, total imports $9694, from United

States $436; builders' hardware, total imports $29,147, from United States $2062; saws, total imports $3052, from United States $1379; other tools, total imports $80,309, from United States $21,057; castings not otherwise specified, total imports $38,596, from United States $5835; table cutlery, total imports $13,493, from United States $242; other cutlery, total imports $71,412, from United States $8547; firearms, total imports $1883, from United States $262; electrical machinery, total imports $22,560, from United States $19,318; laundry machinery, total imports $3610, from United States $343; printing presses, total imports $15,879, from United States $2678; pumping machinery, total imports $8376, from United States $4368; sewing machines, total imports $167,712, from United States $43,883; stationary engines, total imports $9930, from United States $6427; boilers, total imports $88,643, from United States $30,594; typewriters, total imports $26,488, from United States $25,133; other machinery, total imports $131,274, from United States $47,473; detached parts of machinery, total imports $49,806, from United States $20,838; nails and spikes, total imports $6155, from United States $1606; wire, total imports $23,719, from United States $5724; pipes and fittings, total imports $32,233, from United States $23,730; safes, total imports $15,357, from United States $5192; scales and balances, total imports $8928, from United States $6502; stoves and ranges, total imports $4666, from United States $2042; other manufactures of iron and steel, total imports $681,941, from United States $168,808.

Interesting Deductions.

From the above figures it will be seen that while the share of the United States in the iron and steel imports of the islands averaged 21 per cent., this average was exceeded in the items of tools, electrical machinery, pump machinery, sewing machines, stationary engines, boilers, typewriters, other machinery, detached parts of machinery, pipes and fittings, safes, scales and balances, stoves and ranges. In electrical machinery, stationary engines, typewriters, pipes and fittings, scales and balances the United States has a commanding lead over all competitors.

A condensed comparative statement showing the leadership of the principal countries in all the metals and their products, as shown by the imports of the islands is as follows: The United Kingdom leads in iron and steel in their finished forms taken as a whole, zinc and its manufactures, copper and its finished forms; Germany leads in brass and its finished forms, needles, pins and surgical instruments, firearms, iron rails, printing presses, builders' hardware, cutlery, sewing machines and laundry machines.

The officials of the Insular Bureau confidently predict an enormous increase in the importation of agricultural machinery and implements of all kinds in the near future. The natives are not expected to take the initiative in the development of agriculture, but they will adopt improved methods brought to their immediate notice, and it is believed that a few intelligent farmers using up to date appliances distributed among the different provinces would speedily induce the natives to properly equip their small farms or plantations. In this connection the Department suggests that it would doubtless pay some of the leading manufacturers of agricultural machinery, sugar mills, &c., to experiment along this line. A particularly inviting field for agriculture is the production of rice, of which the importations are constantly increasing owing to the inability of the Filipinos to produce their crops without the water buffaloes, which have been destroyed in large numbers in recent years by the rinderpest. It is believed that the adoption of modern agricultural machinery and implements would speedily result in the production of all the rice required in the islands, which last year imported $5,108,341 worth. W. L. C.

The German Sheet Syndicate.—There are some features connected with the German sheet syndicate which are interesting. The 45 members have a minimum participation of 368,000 metric tons based on sheets of 1 mm. (0.039 inch) thickness. Heavier sheets are figured at a lower rate, while lighter sheets are counted at a larger rate. Thus a product of 100 pounds of 1.5 mm. sheets (0.059 inch) are counted as 80 pounds, while 100 pounds of 0.5 mm. (0.0197 inch) sheets are counted as 180 pounds and 100 pounds of 0.375 mm. (0.0148 inch) sheets at 260 pounds. The basis is a capacity of 4 metric tons per 12-hour shift. The different districts participate in the following proportion: Rhenish Westphalia, 185,000 tons; Sieg and Lenne, 115,000 tons; South German, 42,000 tons, and Upper Silesia, 26,000 tons. The largest individual mills are Dillinger Huettenwerke, 32,000 tons; Wolf, Netter & Jacobi, 25,000 tons; Stahlwerk Hoesch, 22,000 tons, and Grillo, Funke & Co., 21,000 tons. The outside mills, some of which co-operate with the syndicate, represent a tonnage of about 40,000 tons. The sales and the distribution of specifications are managed by the firm Verband Deutscher Feinbleck-Walzwerke, at Cologne.

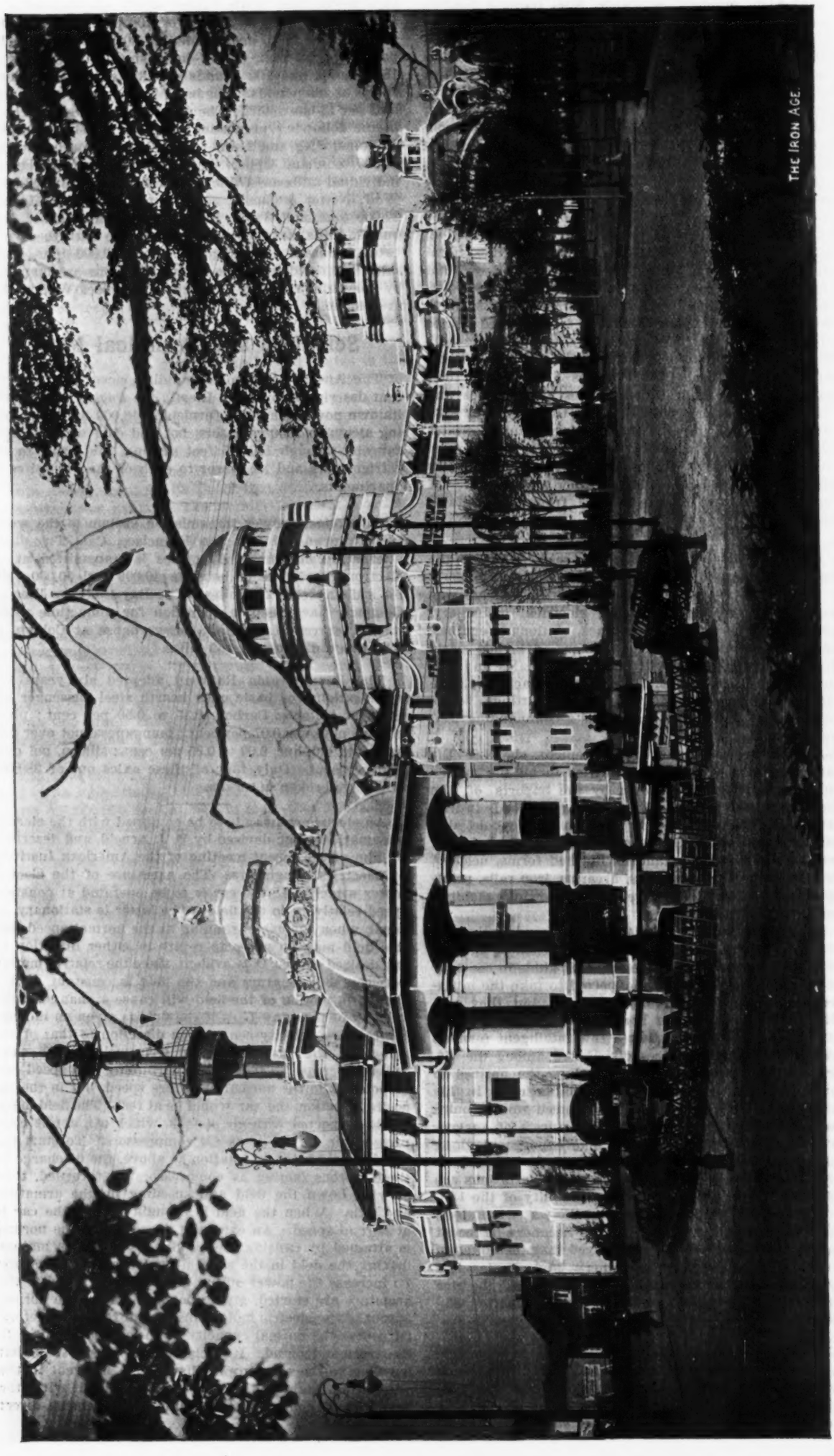
Scientific and Technical Notes.

The Ansonia apartment building, according to a recent description by A. L. Rice in the *Engineer*, will have its own power plant for furnishing 18,000 lights, supplying steam to 2500 radiators, hot and cold water to 1000 faucets, through 160,785 feet of pipe, cold brine to 400 refrigerators and ice water to each of the 340 suites of apartments.

The longest power transmission system in the world is that in and around San Francisco, Cal. Two-phase alternating current of 60 cycles is transmitted at an electromotive force of between 40,000 and 50,000 volts for a distance of 222 miles. The Bay Counties Electric Company have been in operation for some time transmitting current from their power house at Colgate to Oakland, a distance of 152 miles.

The Pennsylvania Railroad adopted six years ago specifications for basic open hearth steel passenger car axles as follows: Carbon, 0.35 to 0.50 per cent.; phosphorus, not over 0.07 per cent.; manganese, not over 0.60 per cent.; sulphur, 0.03 to 0.05 per cent.; silicon, not over 0.10 per cent. Only four of these axles out of 380,000 used have broken in service.

An electric railway is to be equipped with the electropneumatic system devised by B. J. Arnold, and described by him at the recent meeting of the American Institute of Electrical Engineers. The armature of the electric motor attached to the car is to be operated at constant speed relatively to the field. The latter is stationary, as usual, when the car is running at the normal speed, but this field may be made to rotate in either direction at any desired speed. It is evident, since the relative motion between the armature and the field is constant, that a change in motion of the field will cause a change in the velocity of the car. Thus if the field is given an increasing rotative velocity contrary in direction to that of the armature the armature speed (relatively to the axle) will be decreased. If the field is running at a speed corresponding to the normal armature speed, but in the opposite direction, the car would be at rest. The field member is connected with air pistons, which can act as compressed air motors or as air compressors. To start the car, the field being in rotation as above, the discharge of these pistons (acting as compressors) is throttled, thus slowing down the field and speeding up the armature and axle. When the field is brought to rest the car is at normal speed. An excess of speed above the normal is attained by causing the air pistons to act as motors, driving the field in the same direction as the armature. To increase the power output air motors attached to the armature are started, giving power equal to the normal output of the electric motor plus that of these air motors. Of course the normal capacity of the motors is equal to the average demand. It is claimed for this system that it will give the economy of installation inherent in the alternating high voltage system, combined with the flexibility of control of the ordinary low tension direct current system.



THE KRUPP BUILDING AT THE DÜSSELDORF EXHIBITION.

The Düsseldorf Exhibition.

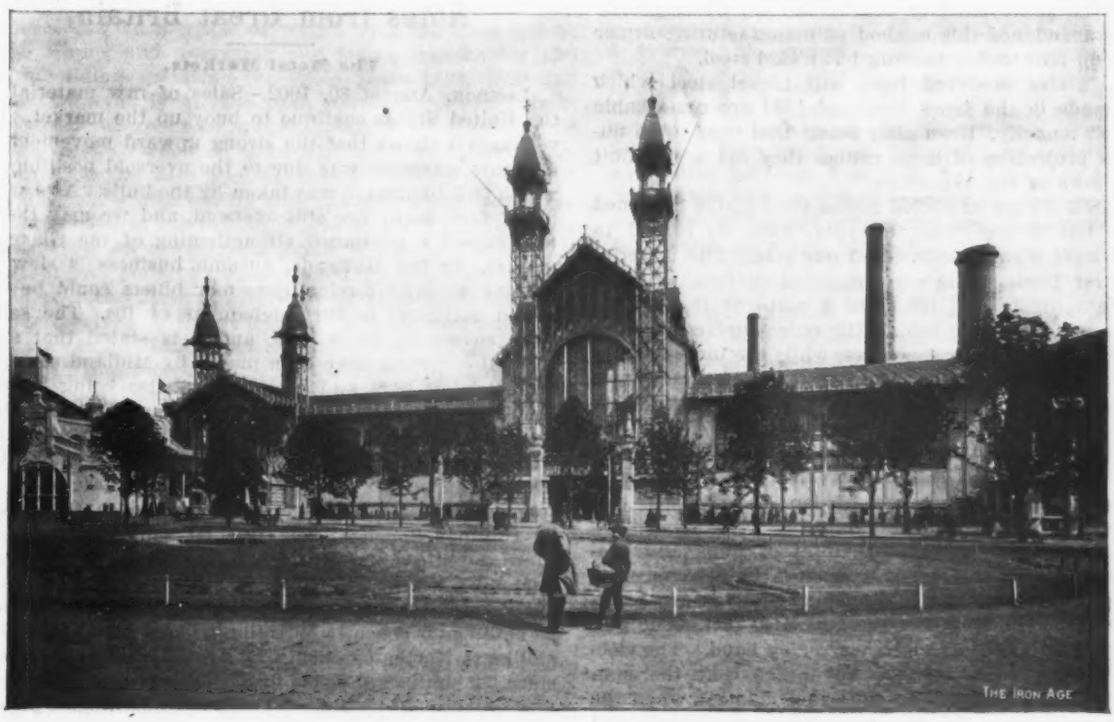
On May 1 there was opened under the auspices of the German Crown Prince the exposition of the Rhenish Westphalian industries at Düsseldorf, Germany.

Although almost provincial, the exposition represents the development of the foremost iron district of Germany and in that manner shows what achievements that industry has effected. Comparatively few of the producers of Germany were represented in Chicago, and none of them participated in the Paris Exposition of 1900. It may therefore be said that the Düsseldorf show is practically the first for many years at which the German industry has had an opportunity to convey to the general public some conception of its magnitude. A similar undertaking was carried through in Düsseldorf in 1880, but at that time the country was exceedingly prosperous; while the collapse of 1900-1901 might have threatened the success of this year's exhibition had it not been for the determination and enterprise of the producers of the Rhenish provinces and Westphalia.

A second steam generating plant is provided for working the rolling mill engines, compressors and steam hammers, which are located in the rear end of the Machinery Hall. This forms an exhibit of the Rhine lignite consumers and consists of three Cornish boilers with 3240 square feet heating surface. Another plant is that of the Bergban Verein, consisting of boilers to work a series of exhibits of mining machinery, including a mine pump capable of lifting 5500 gallons per minute to an elevation of 1650 feet, an ordinary hoisting engine and an electric hoisting engine of 1200 kw. capacity.

A number of the leading iron works of Westphalia have installed their exhibits in special buildings, conspicuous among which is that of Friedrich Krupp of Essen, which covers an area of 46,000 feet, as compared with 20,000 square feet at Chicago and 2500 square feet at the Düsseldorf Exposition of 1880. The weight of the structure is 450 tons and the exhibits together weigh 3500 tons.

As will be observed from the accompanying engraving two towers are placed in advance of the main



GUTEHOFFNUNGSHUETTE AND GAS MOTOREN FABRIK DEUTZ.

THE KRUPP BUILDING AT THE DÜSSELDORF EXHIBITION.

As it is, the magnitude of the show is a brilliant proof of the strength of those industries.

The exhibition occupies a tract of land on the right bank of the Rhine, 1.3 miles long, with an average width of 300 yards. A circular electric railway has been laid down within the exhibition grounds, the total developed length of which is 2.17 miles, with ten stations; service on this line will be carried out by accumulator cars, with or without trailers.

The grounds contain 168 special buildings or pavilions, which cover an area of 152,000 square yards. Twelve of these buildings, with an area of 36,000 square yards, are exclusively for technical exhibits.

In order to provide for power and for lighting there is a plant of 16 boilers, exhibited by different makers, and of 26 steam engines, located in the front end of the Machinery Hall. They vary from 40 to 3000 horse-power and can together develop 12,000 horse-power. All the engines also form exhibits; they are almost all coupled direct to the dynamos. Of the 26 engines in question, nine are tandem, seven vertical compound triple expansion and three are horizontal compound; the remainder are one-cylinder horizontal engines. Few of the horizontal engines are compound, and the builders seem to have given preference in the construction of tandem engines to placing the high pressure cylinder in the rear.

building, which is 360 feet long and 85 feet wide. Between them is a structure which widens out the hall to 105 feet for a distance of 165 feet. In this manner its total length is 465 feet. The north end of the structure is rectangular, that of the south has an apse. On the top of it is mounted a battle ship mast 177 feet high, upon which there is a searchlight and a saluting gun. The apse is like the stern of an old galleon and is ornamented with cables, anchor, &c. The whole is brightened by well distributed gilding and by some coloring. The whole structure looks like an ironclad.

The show piece of the whole exposition is the famous great armor plate which has been placed in front of the Krupp building. With its weight of 106 metric tons it represents the largest piece of rolled steel thus far manufactured. At the same time it is the largest armor plate ever made, since the plate shown in Chicago by the firm of Friedrich Krupp, which at that time was the largest, was only 27.13 feet long, 10.27 feet wide and 11.20 inches thick. The Düsseldorf plate is 43.18 feet long, 13.12 feet wide and is 11.81 inches thick, being 43.6 tons heavier than the Chicago plate. The ingot from which this giant plate was rolled had a weight of 130 tons and was 14.3 feet long, 12.40 feet wide and 3.25 feet thick. It was rolled on a mill such as is shown in the Krupp building. The reversing engine driving

this train has a power of 3700 horse power, the rolls are 13.12 feet long and 3.94 feet in diameter and permit the rolling of steel ingots up to 4.26 feet. The two electric cranes which carry the ingot from the heating furnace to the rolls have a capacity each of 75 tons.

One conspicuous object in the Krupp exhibit is the armored turret, having a diameter of 11.15 feet, a hight of 9.84 feet and a thickness of 4.73 inches. It weighs 10.65 metric tons. It is bent from a single steel plate by a hydraulic press with a maximum capacity of 7000 tons. Krupp has two of these presses at Essen, and shows one of them in the Düsseldorf Machinery Hall.

As for the character of the Krupp armor plate, the 26 plates shown in the Krupp building furnish ample evidence. Some of them are trial plates; others are those selected by the buyer and submitted to tests. Among them are some cast plates. They include compound and nickel steel plates. The former were made in the years 1891 and 1892 under the Wilson patent by casting high carbon open hearth steel on a rolled wrought iron plate and subsequently rolling out this compound plate. The samples show how excellently the welding between the steel and iron was effected and prove the great tenacity of the latter. Subsequently Krupp abandoned this method of manufacturing armor plate and now makes nothing but nickel steel.

The plates produced from soft nickel steel which were made in the years 1892 and 1893 are remarkable for their tenacity. Even after being fired upon with numerous projectiles of large caliber they did not exhibit any cracks or any crumbling.

In 1893 Krupp exhibited nickel steel plates hardened in oil, but in the following year, 1894, he turned to nickel steel plates hardened on one side. The material was first produced in the open hearth furnace, then cast into ingots and rolled to a plate of the desired thickness. After the rolling the outer surface is hardened by a special secret process, while the inner surface remains soft and tough. The resistance of these plates is equal to that of an iron plate three times as thick, or a soft steel plate twice as thick.

For some special purposes and for plates of peculiar form the method of manufacture is to cast the nickel steel plate and subsequently harden it. Plates of this type are also shown in the exhibit.

Krupp has an elaborate exhibit of guns and projectiles. Among the former is a large 12-inch gun used for coast defense which is capable of piercing any existing armor. The length of the gun is 40 feet. The gun may be fired either by electricity or by hand. The electrical arrangement has the advantage that the man aiming the gun can fire at the exact moment when the target is in line. All the movements are electric, and yet a change from electrical manipulation to hand manipulation may be secured in a few seconds. The gun fires projectiles of 771 and 980.8 pounds weight, the charge being 291 pounds of smokeless powder. The muzzle velocity is 3038 feet and the gun can carry 12.49 miles. At that range the projectile would reach an elevation of 9400 feet. If, however, it were mounted at an angle of 45 degrees the highest point of flight would be 28,330 feet, which is nearly equal to the hight of the highest mountain on earth.

Among other guns shown is an 11.02-inch gun for battle ships and an 8.26-inch gun mounted on a disappearing carriage.

One of the interesting exhibits for shipbuilding purposes is the main shaft of the steamship "Kaiser Wilhelm der Zweite." It is 233 feet long and has a weight of 226.2 tons. Krupp has also a very extensive exhibit of castings and a boiler plate 85.3 feet long, 10 feet wide, 1.49 inches thick, weighing 29 tons. The Gruson Werk, which is controlled by Krupp, shows chilled castings and a series of mining machinery which is a specialty of the concern. The Germania Shipyard, also controlled by Krupp, has a series of models of ships.

Among the buildings which honestly present the plain iron construction, avoiding all temporary materials, is the Hall of the Gutehoffnungshütte at Oberhausen, which also houses the exhibit of the Deutz Gas Engine Works. The idea carried out was to produce a factory building, as it is usually built, with comparatively little extra outlay. There were only added the frame portals, which serve an architectural effect, and the hight of the main hall was made unusually great, being 95 feet. The building is so constructed that it may later on be used directly as a shop. There are added to the main structure, which is 69 feet long, two side aisles, each of 68 feet, which are also used by the works. To the left there is attached directly the building of the Deutz Gas Engine Works, being 525 feet wide. In order to carry out the idea of a shop building the walls are not plastered, but are in masonry. The idea was followed of having as few parts and ornaments made of wood as was possible, because the proof was to be furnished that iron may be effectively employed for this purpose.

The Gutehoffnungshütte built the 1000 horse-power blast furnace gas blowing engine designed by the Gas Motoren Fabrik Deutz, which has been described in the columns of *The Iron Age*. It was designed to make 135 revolutions per minute and is fitted with Stumpf delivery valves.

Notes from Great Britain.

The Metal Markets.

LONDON, August 30, 1902.—Sales of raw material to the United States continue to buoy up the market. Investigation shows that the strong upward movement in Glasgow warrants was due to the oversold position, of which full advantage was taken by the bulls. As a matter of fact, many are still oversold, and we may therefore expect a continued strengthening of the Glasgow market. In the Midlands, autumn business is slow in opening up, and foreign Bessemer billets could be obtained delivered in Birmingham at £4 10s. The same price covers tin plate bars, and it is stated that substantial contracts have been placed by Midland consumers. Belgian bars and sections are also being offered freely at cut prices. Bars are offered at £5 15s., delivered Birmingham, and beams at £4 15s. at Antwerp. Pig iron is about the only staple article that maintains firmness in price. At the time of writing prices are as follows: Scotch warrants, 57 shillings 6 pence; Cleveland, 52 shillings 9 pence; hematite, 60 shillings 10 pence; forge qualities, Staffordshire cinder, 50 to 51 shillings; part-mine, 53 to 55 shillings; all-mine, 57 shillings 6 pence to 67 shillings 6 pence; best Staffordshire cinder, 55 shillings 6 pence to 80 shillings; cold blast, 95 to 100 shillings; Northamptonshire, 52 to 53 shillings; Derbyshire, 52 shillings 6 pence to 53 shillings 6 pence; North Staffordshire, 53 shillings 6 pence to 54 shillings 6 pence; Lincolnshire, 56 shillings 1 penny.

Finished Iron.—Marked bars, £8 10s.; Earl of Dudley's brand, £9 2s. 6d.; second grade, £7 10s.; common unmarked bars, £6 12s. 6d. to £6 15s.; North Staffordshire bars, £6 15s.; angles, £7 10s. to £7 15s.; sheets, singles, £7 12s. 6d. to £7 17s. 6d.; doubles, £7 15s. to £8; trebles, £8 7s. 6d. to £8 12s. 6d.; galvanized corrugated sheets, f.o.b. Liverpool, £11 5s. to £11 10s.; hoop iron, £7 5s. to £7 10s.; nail rod and rivet iron, £7 5s. to £7 10s.; gas strip, £7.

Steel.—Bessemer billets, £4 15s. to £5; best Siemens billets, £5 to £5 5s.; mild steel bars, £6 10s. to £7; steel plates, £6 10s. to £7 10s.; steel girders, £6 to £6 5s.; steel angles, £5 15s. to £6 5s.

On Thursday night the total stocks in public stores in the United Kingdom amounted to 198,646 tons. Shipments of pig iron to the United States during the month of August will considerably exceed those of July. With three or four more days to run the pig iron shipments already exceed last month. The same remark is true of manufactured iron, but there has been a considerable shrinkage in steel. The other metals are, on the whole, quiet, copper showing a distinct upward tendency, some business having been negotiated at £51 15s. and at three months £52. 1s 3d. The copper market, however, is slightly wavering, and prices vary by half a crown or 5 shillings each day. From a well informed source I quote the following Scotch comment upon the situation:

"This boom in the raw material has been a source

of annoyance rather than of gratification, to the majority of the firms engaged in the manufacture of malleable iron and steel. As the home demand for malleable iron and steel is only moderate, and by no means sufficient to enable makers to raise their prices of the manufactured article, the position, so far as they are concerned, is one of great difficulty."

Wages in 1901.

For the first time since 1895 theLabor Department of the Board of Trade in its report for the year 1901 has to record a decline in wages. From 1896 began an upward movement, culminating in the year 1900, when the general level of wages stood higher than in any other year for which statistics exist. In the industries for which it is possible to obtain specific information it would appear from this abstract that about 430,000 work people received advances during the year amounting to £41,000 per week, while 493,000 sustained decreases amounting to £118,000 per week. Thus the net weekly decrease for 1901 was £77,000, compared with increases of £209,000 in 1900 and £91,000 in 1899. It is when we come to the mining and metal industries that we discover how very serious the decrease has been to the wage earners concerned. During 1901 it is a strange fact that all the trades saw an increase of wages with the exception of the mining and quarrying and metal, engineering and shipbuilding. During the three years 1898, 1899 and 1900 practically all the coal miners in Great Britain received advances in wages. This was especially the case in 1900, when all the coal miners averaged an increase per week of slightly over $1. There are 704,681 work people affected by this change, which shows an average fall in the rate of wages of 1 shilling 7½ pence per week, or a weekly decrease of nearly £60,000. Its extent may perhaps be understood if I put it that during the year the miners received over $15,000,000 less than they received in the year 1900. But the iron and shale miners suffered more per head than the coal miners, the drop in their wages being at the rate of 6 shillings 6¼ pence per head. As, however, only 16,000 workmen were affected, it is not an important factor in the economics of wages.

In 1899 and 1900 the work people engaged in the production of iron and steel shared to a greater extent in the general advance of wages than those in the other sections of this group; in 1901 they sustained the greatest decreases in wages. In this branch wages, being mainly regulated by sliding scales, are most closely affected by the movements of the markets.

In the pig iron industry the fall in wages in 1901, 5 shillings 3 pence per week, was computed as eqbal to a decrease of £4595 in weekly wages as compared with an increase of £2229 in 1900. In the manufactured iron and steel trades wages fell heavily. Over 52,000 work people sustained net reductions averaging 6 shillings per week. The aggregate net decrease amounted to £15,748, and compares with an increase of £12,537 in 1900. The reductions in the case of the steel workers were large. In South Wales they sustained reductions amounting to 22¼ per cent., in Scotland to 20 per cent. and in the North of England to sums varying from 10 to 36 per cent.

In the engineering and shipbuilding trades over 12,000 work people received increases averaging 1 shilling 4¼ pence per head, and slightly less than 9000 sustained decreases averaging 1 shilling 1¾ pence per head. The decreases were practically confined to Scotland, and are the first of any importance that have taken place since the beginning of the upward movement in wages in 1896. The increases include an advance of ¼ penny per hour, or 1 shilling per week, to the London engineers. London wages had not been changed during the years 1896-7-8, when the wages in every other important engineering center were increased. In the tin plate trade employment improved during 1901, but wages remained practically unchanged. In the miscellaneous metal trades over 10,000 work people had their wages reduced. Nearly all of these were employed in the Birmingham metal, wire, tube and bedstead trades.

The Sydney Harbor Bridge Contracts.

The particulars of the contract for a bridge across Sydney Harbor, N. S. W., have now been made public. Nineteen tenders have been received, nine from Great Britain, one from France, one from the United States and eight from Sydney, seven of the latter being from a single firm representing oversea syndicates. The designs invited were for a steel bridge with approaches 3000 feet in legnth, and having a fair way of at least 1200 feet between the two main piers. Tenderers had the option of providing for two roadways of 30 feet each or one of 60 feet. Provision was also to be made for an elevator capable of carrying 20 persons, giving access from the roadway and footway of the bridge to the top of the main tower of the cantilever on the Sydney side. The estimate of the State Department of Works was a little over £1,000,000. The tenders were as follows, each being for a bridge without approaches:

Alex. Findlay & Co., Motherwell, Scotland	£1,661,866	12s.
Alex. Findlay & Co., Motherwell, Scotland	1,517,694	16s.
Alex. Findlay & Co., Motherwell, Scotland	1,523,827	2s.
Wm. Arrol & Co. and Head, Wrightson & Co	1,710,688	0s.
Cleveland Bridge & Eng. Company, Darlington	1,794,118	19s.
Compagnie de Fives, Lille, France	3,050,750	0s.
E. & C. Bridge Company, England	1,843,855	17s.
E. & C. Bridge Company, England	1,792,962	17s.
E. & C. Bridge Company, England	1,866,395	0s.
J. Stewart & Co., Sydney	1,221,152	0s.
J. Stewart & Co., Sydney	1,933,194	0s.
J. Stewart & Co., Sydney	1,593,216	0s.
J. Stewart & Co., Sydney	1,112,859	0s.
J. Stewart & Co., Sydney	1,587,272	0s.
J. Stewart & Co., Sydney	1,462,834	0s.
J. Stewart & Co., Sydney, delivery only	Schedule rates.	
Gilbert Weaver, 105 Abercrombie street, Sydney	1,775,207	2s.
Henning & Hilderbrand, New York	2,000,000	0s.

The tender from New York has been rejected, as it was cabled without full particulars, but of course a good deal of interest will center upon the syndicate tenders which appear in the name of the Sydney firm.

Railway Notes.

P. & W. McLellan, Limited, of Glasgow have just shipped a large quantity of railway material for South America and China. The South American shipment was made to standard American patterns. The total quantity shipped was about 17,000 tons, and as delivery was urgent, the entire consignment was completed three weeks inside contract time—a very creditable performance.

Colonel H. A. Yorke, the senior inspecting officer of railways, has been commissioned by the Board of Trade to proceed to America early in September to report on the working of American railways, including both steam and electric lines.

Two Important Dividends.

The profit available for distribution by Bolckow, Vaughan & Co., Limited, including amounts received from subsidiary companies, and after providing for depreciation, amounts to £183,462. This sum added to the balance brought forward from last year of £124,823 gives a disposable surplus of £308,286. During the year £134,894 was expended upon extensions, new plant, machinery, new coal winnings, &c., and of this sum £78,421 is written out of the profits. The nominal capital of Bolckow, Vaughan & Co., Limited, amounts to £4,000,000, but the called up capital only amounts to £3,218,380. The dividend this year is 5 per cent., compared with the last two previous distributions of 8 per cent. and 8 2-3 per cent. Last year the chairman warned the shareholders not to expect another distribution of 8 per cent., and the fall in consequence has not been unexpected. There is a reserve fund of £250,000, and in 1899 the properties of the Clay Lane Iron Company were purchased at a cost of £215,000, which was provided out of revenue, no increase having taken place in capital account for about 20 years.

Turning now to another great amalgamation, that of Guest, Keen & Nettlefolds, Limited, a good year's work has to be recorded. Guest, Keen & Nettlefolds, Limited, are an amalgamation of the business of the Dowlais Iron Company, Guest & Co., the Patent Nut & Bolt Company of Birmingham, manufacturers of steel and iron railway fastenings, and Nettlefolds, Limited, the well-known firm of screw and wire manufacturers. The total issued capital of the combined companies is £4,535,500, out of an authorized limit of £4,850,000. The profits just reported cover 12 months' working on the part of Guest,

Keen & Co. and 15 months of Nettlefolds, Limited. After providing for the payment of formation expenses in connection with the amalgamation, the profit amounts to no less than £447,204. After providing for the interest and interim dividends and other expenses, there is a surplus of £249,025. A dividend on the ordinary shares of 10 per cent. has been paid, and a large sum carried forward. It will be remembered that Arthur Keen, the head of this large company, with some of his colleagues, paid several visits to the United States to study American methods and American machinery. The reorganization which Arthur Keen brought about would seem, therefore, to have amply repaid him for time and trouble and capital outlay. S. G. H.

Paying Too Much for the Whistle.

Scientific Engineering Run Wild.

BY A ROLLING MILL ENGINEER.

Benjamin Franklin, going out one morning, met a boy in the street who was blowing a whistle. The sound of that whistle had a particular charm for Benjamin, and the result was that he parted with his jackknife, his spinning top, his alleys and all the pennies he had to obtain the whistle. Having obtained it he made such a noise all day that toward evening he was punished and sent to bed crying. His father, who had heard of the above transaction, remarked: "Benjamin, my boy, you have paid too much for your whistle."

Should Get Money Back in Three Years.

When we contemplate what has been and is being done in this country by engineers, including rolling mill engineers, by the way of attempting improvements and introducing complicated devices to save labor and to reduce the cost of production, and study the results obtained in a great many cases, it can be said that the manufacturers or proprietors of the establishment have "paid too much for their whistle." When does, figuratively speaking, a manufacturer pay too much for his whistle? Assuming that he has, at a given time, a rolling mill plant in operation and changes are suggested by the way of improvements to increase the product and decrease the cost, it is commonly agreed that if he does not get his money back for his expenditure in three years he is "paying too much for his whistle."

When an engineer will design, construct and place in operation a hot bed to take care of hoops after they have been rolled to save the labor of two boys at $1.25 per day, and when this hot bed costs in the neighborhood of $15,000, and requires two machinists at $2.50 per day to take care of it, then this is a clear case of where "too much has been paid for the whistle."

Superfine Pinions.

Great pains have recently been taken to improve certain parts of a rolling mill; take, for instance, the pinions for driving the same. In some cases they have pinions made from nickel steel, having the teeth cut, housings made in three sections, planed; bolts fitted as neatly and as perfectly as a main spring of a watch. This set of pinions and housings complete will cost more than the entire cost of a first-class mill. At first sight we are apt to come to the conclusion that this is imperative, owing to the troubles and stoppages they have in other mills which have not adopted this superfine method of getting up pinion housings and pinions for a mill. What do we find? In such rail mills as are now in operation at South Chicago and also at the Edgar Thomson Works, where a minute's lost time is a most serious affair, where more rails are produced than on any other two mills on the face of the globe, we find that it is seldom, if ever, that any stoppages are caused by any trouble from the pinions driving these mills; and yet these pinions and pinion housings are of a type that has been used for at least the last five years without any improvements. Since this is so, then the extra expenditure upon anything that is unnecessary is "paying too much for the whistle."

A Crop End Calculation.

One of the great items in cost is the loss there is in rolling bars, owing to the crop ends. Hence everything that is rolled in the shape of iron and steel is rolled as long as possible to save the loss in crop ends. In a bar of 30 feet we have two crop ends. If we are rolling 60 feet and cut into 30 foot lengths we have two bars with two crop ends, and so on. There is an old saying: "The greatest defect in penetration is not that of getting up to the point, but of going beyond it." Have we gone beyond the point, so far as gaining the best results by the way of saving in crop ends, in the use of the excessive hot beds which are now being used? Have we not got to the point where, in this direction, we are "paying too much for our whistle?"

Let us take the case of a modern merchant mill, such as are in operation at the present time, which can produce 300 tons every 24 hours of ¾-inch round bars, and let us assume that they are rolling bars on this mill 200 feet long. Let us assume another mill producing the same quantity in the same time, rolling bars of the same size, 400 feet long. Let us see what loss there is in crop ends when rolling bars 200 feet long above that of rolling them 400 feet long. Assuming that in both cases 75,000 tons are rolled in one year, then we find that the gain in rolling the long bars over that of rolling the short ones (assuming the ¾-inch round was rolled the entire year) in favor of the 400 feet bars would be a little over $1800 per year. But what is the extra expenditure necessary to pay for this extra 200 feet of hot bed and building? Figuring moderately it will be at least $50,000. Now, without figuring on any extra cost in keeping this extra 200 feet of hot bed in repair, but just what could be done with this $50,000 if put out at interest (will say in this case at 5 per cent.), we have $2500 per annum. The saving in crop ends of 400 feet long over that of 200 feet long is about $1850. Is not this a clear case of where they "paid too much for their whistle?"

Misapplied Ingenuity in Small Billet Mills.

The making of tin plate bars, small billets, 4-inch billets in large quantities, splice bars, &c., direct from the initial heat of the ingot is commanding a great deal of attention, and millions of dollars have been spent during the past five years to gain the best results in that direction. Tandem and semicontinuous mills have been introduced; rolling mills having three engines and three separate three-high mills are in operation at the present time; and rolling mills that have cost $500,000 have been erected for the purpose of only making small billets from a 4-inch billet and also for making tin plate bars. Continuous mills of the finest type, embracing all the ingenuity and also embodying remarkable features in the engineering line, including flying shears, and 3000 horse-power engines to drive the same, all have been placed in operation for the express purpose of making billets from 1½ inches square upward. A case can be cited where an acre of ground has been covered with works embodying the most intricate plans, surmounted with a great deal of expensive machinery, which cost nearly a million dollars, only for the purpose of making from a bloom 4-inch billets and small billets under 4 inches square. Nearly 20 years ago improvements were made at what was then the Joliet Works, which consisted of a three-high blooming train, one set of three-high roughing rolls and one set of three-high finishing rolls, each train being driven by a separate engine. This mill was originally constructed for making rails. To-day they are making angles, splice bars at the rate of over 300 tons per turn, small billets at the same rate, tin plate bars at the rate of about 200 tons per turn, and at the same time are constantly occupied in the roughing train, making 4-inch billets. They are averaging a total of 1800 tons every 24 hours. Here is a plant built 20 years ago producing a variety of material which none of the above mentioned modern plants can produce, which can be duplicated for about $400,000, not including blooming mill, and yet can produce as cheaply as the most modern complicated mill. If so, is it not a fact that all the manufacturers who

have put in mills since that time, to produce the products named, have "paid too much for their whistle?"

Excessively Rigid Inspection Without Benefit.

During the period of 1892-1896, when all material made from steel and iron was selling at the lowest price ever known in our history, when specifications were more rigid than they ever were before or since, it was customary, as it is also at present, for railroads and others to have their inspectors examine the rails and other material required before it was shipped. Some manufacturers and one in particular, in their zeal to turn out the best product to gain a high reputation for their material, and in the belief that in time they would gain such a reputation for what they were selling that when dull times came and competition became keen they would not only receive the preference in getting orders, but would also get a better figure for the same, were not satisfied with the inspection supplied by the railroads. Strange as it may seem, they did not deem the inspection rigid enough. Therefore the management established an inspection bureau of their own, and as a matter of fact many thousand tons of rails which were accepted by the railroad inspectors were rejected by the rolling mill inspector. Rumor said that the railroad officials spotted where some of these rails were piled in the yard and that afterward they bought them as second-quality rails and laid them on the main line. But in spite of all this and of the remonstrances upon the part of many this policy was adhered to. But when the break of the steel rail pool took place and rails dropped from $28 to $16, this mill, with its unnecessarily rigid inspection, had to meet the open competition upon the market without any favors; in fact, at the end of the excitement it was found that, if anything, they were behind those (in the average price obtained) who were satisfied with the inspection furnished by the buyer. Is not this a case of where they "paid too much for their whistle?"

It has been remarked by many—judging from what has been and is being done at the present time in the engineering line—that scientific engineering has run wild, and to the unbiased mind a great many cases can be shown to prove this assertion.

Some Small Mills Show Surprising Results.

Some singular incidents bordering upon satire on the efforts of the scientific engineers of this country (who claim that by adopting some of the ingenious devices which they advocate the manufacture of iron and steel can be cheapened) were brought out when the great United States Steel Corporation were formed, and when the Republic Iron & Steel Company had absorbed all the other small rolling mills who were manufacturing iron and steel throughout the country. The United States Steel Corporation, in comparing notes as to the best practice and the mills that gave the best results, were greatly surprised to find that some of the small steel mills in this country, which were designed and erected nearly 20 years ago, showed the best results so far as earning capacity was concerned. I question if in all the properties obtained by the United States Steel Corporation any of these different properties or mills showed as good a result as to earning capacity with as small an outlay in capital as the King, Gilbert & Warner steel mill at Columbus. Here we find a steel mill having the smallest converter of any in the United States, built away back in 1880, with buildings of the old fashioned type, common high pressure engines, soaking pits of the oldest type, steam pipes uncovered, boilers and gas producers with no building over the same; and yet during the dark days in the midst of the panic of 1893-1896 this mill every day throughout the year made a product in the shape of 4-inch billets, and met the lowest price in the market and continually paid dividends. We find other steel works with a large engineering corps, a multitude of draftsmen who were continually working on improved plans, whereby the cost of production would be reduced, and yet when the end came they could not produce as cheaply as that mill in Columbus. As a matter of fact the Carnegie Steel Company, with all their wealth and engineering ability, with Andrew Carnegie at their head, could not produce a 4-inch billet much cheaper than was produced by this small steel mill at Columbus. This evidently goes to prove the saying that "The race is not to the swift, neither is the battle to the strong," &c.

Dividends Paid by Rattletraps.

In fact, when noting the results shown by some of the rattletraps of rolling mills that were bought up by the Republic Iron & Steel Company, it is found that in many cases the greater the rattletrap, the older fashioned and antiquated the mill, the greater the dividends they paid. The writer remembers distinctly twitting some of the officials of the Republic Iron & Steel Company about buying an antiquated rattletrap of a mill, and was surprised to be informed that that mill had a greater earning capacity—considering the capital invested—than any other mill bought by them. My reason for bringing up these thoughts is not by any means to discourage improvements from a scientific point of view, introduced with the object of cheapening the cost of production or improving the condition of both the manufacturers and the laboring men, but is to waken the thought that we rolling mill engineers in this country are at the present time too prone to go beyond the line of common sense, and in our zeal to obtain the best results from an engineering and commercial point of view are apt to compel our clients, the manufacturers, "to pay too much for their whistle."

Nationalization Plan for Journeymen Plumbers' Union.

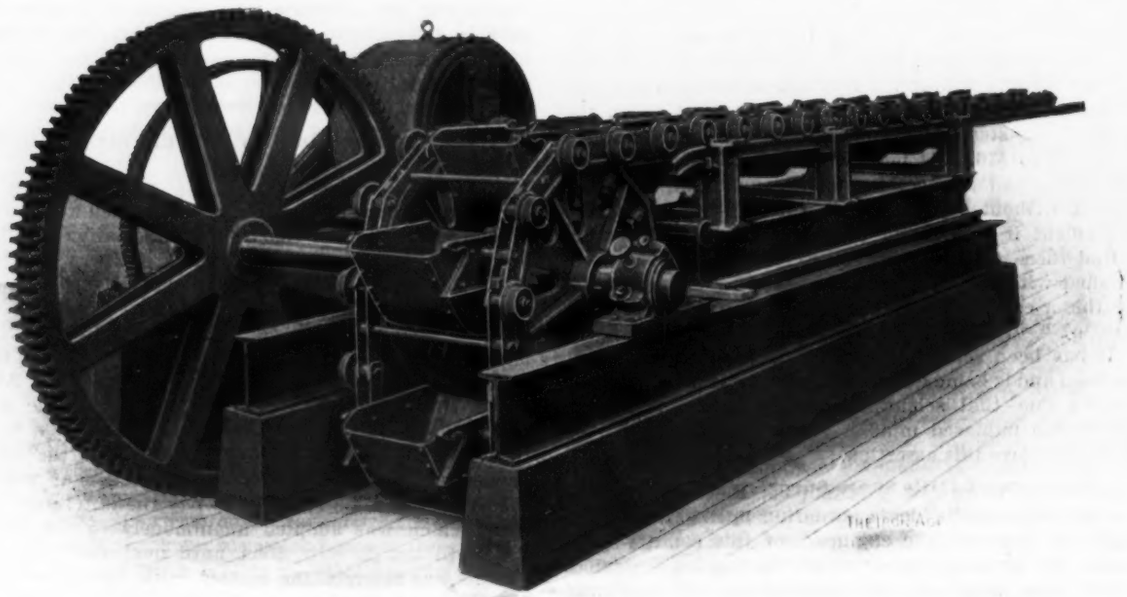
One of the most important actions taken at the recent annual convention of the United Association of Plumbers, Gas Fitters and Steam Fitters' Helpers in Omaha, Neb., was the adoption of a nationalization plan recommended by the Executive Committee of the union. The various local unions under this plan will pay to the national organization such funds as may be required, a strict account being kept of the transactions. At the end of the year a balance will be struck and the unions which have contributed more than the average will be repaid, while those whose contributions to the general expenses of the association have not been as much as the average will be required to pay the difference. This plan, which was adopted unanimously by the convention, will not go into effect until next year. The convention has referred the matter, with its approval, to a referendum vote of all the members of the union. The vote will be taken by the 350 affiliated unions on October 27, and the final adoption of the plan will depend upon the result of this vote. It is understood, however, that the attitude of the journeymen plumbers is such as to insure the approval of the plan.

The plan is somewhat of a departure in American unions, although it has been in effect to a great extent in the German unions, and was brought from that country with slight modifications by the Cigar Makers' Union, by which it has been operated with more or less success for several years. The plumbers' plan is a slight modification of that of the cigar makers. There is provided a death benefit of $100, a sick benefit of $5 per week for a term of 13 weeks and a strike benefit of $5 per week for 16 weeks, after which the benefit drops to $3. The most radical feature is an old age pension of $500. This is paid to a member of the union who after having carried membership in the union for 25 years becomes incompetent by reason of old age.

The Hoover & Mason Ore Handling System.—An annoying error appeared in the article on "The Hoover & Mason Ore Handling System," which was published in our last week's issue. On page 3, in describing the operation of unloading an ore vessel and manipulating the scraper, the word "hourly" should have preceded the word "cost" in the following sentence: "The best work so far accomplished was the taking out of an entire batch containing 540 tons in four hours and one minute at a total hourly cost of $2." The omission of "hourly" changed the statement decidedly.

A Scotch Coal Conveyor.

At the Central Power Station of the Glasgow Electric Tramway the coal is fed to the boilers from overhead bunkers holding 2400 tons. These bunkers are filled by two gravity chain bucket conveyors, constructed by the Mirrlees-Watson Company, Limited, of Glasgow. Each conveyor can handle 50 tons of coal per hour and draws its supply from an outside bunker, built just outside the main building, which, in turn, is supplied from six railway tracks which enter on two different levels. The buckets used in these conveyors are supported on either side by short spindles, which pass through the chain on the one hand and enter sockets in cast steel brackets attached to the side of the buckets on the other, and are suspended in such a way that the loaded or empty bucket retains its proper position in virtue of the action of gravity. The accompanying illustration gives a good idea of how this is brought about. The motive power in each case is supplied by a powerful four-pole continuous current shunt wound dynamo. These motors are connected to a 500-volt circuit and run at a speed of 200 revolutions per minute. This speed is reduced to suit the conveyor by a series of spur wheels, the last of which is connected up to the driving cant wheels by a common spindle. These driving wheels are of cast steel with ten cants and have steel reinforced teeth projecting from their faces at such a pitch as to engage steel rollers between the links of each chain, by means of which the motive power is transmitted to the conveyor.



A SCOTCH COAL CONVEYOR.

An ingenious and original design of tilting gear is used for emptying the buckets at any point along the line. This gear, which can be fixed at any point where it is desired to unload, consists in a couple of levers with a small roller on the end of each. These rollers enter pockets in the bucket side plates, which are steadily rotated until they have emptied, after which they are released and left free to continue their course. This process takes place in a smooth and satisfactory manner without in any way interfering with the steady and continuous motion of the conveyor. The tension gear consists of two plummer blocks with a screw attachment to pull them along slides in a cast iron base. The conveyor chain passes over two cant wheels keyed to a shaft with these plummer blocks as bearings. In this way the conveyor chain is kept as taut as is found necessary for its proper working.

A novel method of distribution is introduced to fill the buckets while in motion. This consists in a revolving box shaped contrivance driven by a spur wheel which engages the moving chain, and is so designed that it is open only when the bucket is in a position to receive the coal or ash, as the case may be. This distributing box is fed by a chute from the side.

The total length of each conveyor is about 860 feet, including a vertical lift of 107 feet. The buckets move at a speed of 45 feet per minute. The whole arrangement of the boilers, bunkers, chutes and conveyors reduces manual labor in this department to a minimum.

The railway trucks containing the coal are run into position over a series of bunkers, into which they are emptied direct. The conveyor, passing underneath, is fed by allowing the coal to pass from the bunkers into the distributing box described above. The tunnel under the bunkers is about 110 feet in length and when filled the buckets pass over guide cant wheels, traveling back its extreme length, passing around another couple of guide cant wheels and rising vertically through a distance of about 33 feet to ground level. The conveyor assumes a horizontal motion for some 215 feet along the bottom of the boiler house. It then rises 74 feet to the top of the building. In traversing the 210 feet along the top of the boiler house the buckets are emptied at various points into the coal hoppers over the boilers by means of the tilting gear already mentioned. The empty buckets descend the other side of the boiler house back to the tunnel, where they may once more be filled, and thus complete their cycle of operations. The coal in the hoppers passes to an automatic weighing machine, and thence by a chute to the stokers, also automatic, of the Babcock & Wilcox boilers. The conveyor is also used for removing the ashes from the boilers to the railway trucks, to which it passes through a chute in the boiler house wall. The conveyor receives the ashes from specially constructed ash pits and elevates them to a storage hopper, from which they are delivered to railway wagons.

The boilers are fed from two large storing tanks, which are supplied from the ordinary public water service. These tanks, which are 25 x 12 x 10 feet each, contain 18,000 gallons, and the feed water is forced into the boilers by five electrically driven feed pumps, also made by the Mirrlees-Watson Company, operated by electric motors, and one steam driven feed pump. The former pumps are capable of delivering 8000 gallons per hour against a boiler pressure of 180 pounds per square inch, and the Weir pump is capable of delivering 16,000 gallons of water per hour against the same pressure.

In dealing with the large quantity of exhaust steam which is inseparable from the working of a big power station such as this it is necessary not only to provide an efficient and trustworthy set of condensers, but it is also very important that floor space should be econ-

omized and utilized to the greatest advantage. The condensers were designed with this object in view and have a neat and compact appearance. The larger one is capable of condensing 60,000 pounds of steam per hour, and the smaller, which is used as an auxiliary, 24,000 pounds of steam per hour. The condensers have thick cast iron shells, greatly strengthened by a network of ribs. The tube plates are of rolled brass with solid drawn brass tubes, expanded at one end and packed with cotton wick, set up with screwed ferrules at the other. The larger condenser contains 2690 of these tubes, and the smaller, or auxiliary, 1072, and through these the circulating water passes twice.

In front of the condensers are four Edwards three-throw air pumps, manufactured by the same company, which have a very high efficiency and dispense with foot and bucket valves. Each set of pumps is run in connection with one of the large condensers and is capable of dealing with 60,000 pounds of exhaust steam per hour. For driving, a slow speed electric motor is coupled up direct to the crank shaft, and in this way all waste of power due to transmission through a series of spur wheels or other speed reducing devices is effectively avoided. Besides this, the arrangement provides a neat and compact machine occupying a minimum of floor space, which is a most important factor in the design of power stations. The pumps have 16-inch diameter buckets with a stroke of 12 inches, and the crank shaft runs at 150 revolutions per minute. The electric motor is connected to a 500-volt circuit.

Besides the four larger air pumps there is also one smaller auxiliary pump, 11 inches diameter by 10 inches stroke, of a similar design to those described above. This smaller size can deal with 24,000 pounds of exhaust steam per hour and, like the larger size, its motor runs at a speed of 150 revolutions per minute.

The New Westinghouse Electric Traction System for the Operation of Interurban Roads.

The Westinghouse Electric & Mfg. Company of Pittsburgh have recently contracted for the equipment of an important interurban road with alternating current apparatus throughout. The road in question is the Washington, Baltimore & Annapolis Electric Railway, which is to operate a line from Washington to Baltimore, about 40 miles in length, with a branch to Annapolis, 15 miles in length.

In the ordinary method of operating street railways direct current is fed to the trolley line for the car motors. For city lines and densely populated districts the current is often generated as direct current, but for long distance interurban roads this would involve a cost of copper conductors entirely prohibitive. To meet the latter objection a system has been used thus far in this country involving the generation of alternating currents at high pressures of from 10,000 to 30,000 volts and the transmission of the same to substations, where by means of transformers and rotary converters the current is supplied to the trolley wire as direct current at the usual railway voltage of from 500 to 650 volts. The rotary converter substation, however, has always been an undesirable feature, chiefly on account of the cost of the apparatus and building and the attendance required. The plans that have been proposed to do away with this feature are numerous, but before this none have appealed to practical American street railway engineers.

In Europe the polyphase induction motor has been used to some extent, but it implies the use of two or three overhead wires, and, moreover, the characteristics of the induction motor in regard to starting and average efficiency in railway service are said to be not of the best. Other systems which have been proposed involve the use of single phase motors upon the cars driving generators, which in turn supply power to the motors on the axles. However, this involves the placing of a substation upon the car itself, and so cannot be considered a great improvement over the ordinary alternating and direct current system. Details regarding the new system of the Westinghouse Company are not at hand, but it is known that by its use the limitations of the induction motor and the disadvantages of the multiplicity of overhead conductors, as well as the great cost of the system just described, will be avoided.

For the road which is now being constructed between Washington and Baltimore single phase alternating current will be generated in a main power house located at Hyattsville by three 1500-kw., single phase, Westinghouse generators, delivering current at 15,000 volts and driven by cross compound, Hamilton-Corliss engines. This station is of more than average size and is in no sense experimental. The power house will be built of brick with stone and concrete foundations, and will contain in addition two 125-volt direct current generators to be used as exciters for the alternators and a large switchboard with electrically operated oil switches, circuit breakers, lightning arresters, &c. Current will be distributed from the power house at 15,000 volts to transformer stations located at suitable intervals along the line. These transfomer stations will contain only stationary transformers with the necessary switches and fuses, but no moving machinery, and will therefore not require the presence of an attendant. From these stations current will be fed to the single trolley wire at 1000 volts. The pressure of 1000 volts which has been adopted for the trolley wire is not a necessary part of the system, as a much higher voltage could have been used if it had been deemed advisable by the engineers of the road.

The cars will probably be 60 feet in length and weigh about 50 tons each. They will be supplied with master car builders' trucks designed for high speed. The track is laid with 80-pound rails and it is expected that the distance of 31 miles will be made in 45 minutes, including stops. The cars are to be equipped with four motors, each of 100 horse-power, and it is expected that a normal speed of 40 to 45 miles can be attained and a speed of 60 miles reached when necessary.

The motor, which is the novel part of the equipment and the key to the entire system, is a variable speed motor. It has been developed and tested in severe service during the last few years by the Westinghouse Electric & Mfg. Company, under the supervision of B. G. Lamme, assistant chief engineer.

As stated before, the power house is now being erected at East Hyattsville, Md., where the railway company own a site of 3 acres. The power house will be completed in about 12 months, will be 133 x 203 feet in size and cost in the neighborhood of $350,000. It is located conveniently to water for condensing purposes and to railway facilities for handling coal, and will furnish power for the Chesapeake Beach Railroad, which is to discontinue the use of steam, and perhaps in addition to manufacturing plants to be located in this neighborhood.

The company are to take over a small direct current road about 14 miles long running from Washington to Laurel, Md., and current for this line will be furnished by two 200-kw., single phase, rotary converters located at the power house in Hyattsville. This apparatus is also a new departure and of considerable interest, especially since it shows the possibility of operating the new system with existing direct current plants.

It is to be remarked that this latest development in electric railroading follows in a path already traced by electric lighting. The first electric lighting systems employed direct current at low voltage, but as the area to be supplied increased this involved a cost of copper cables. To meet the difficulty, alternating current distribution at high voltage was adopted, with rotary converter substations to enable the current to be distributed on the existing mains as direct current. However, most electric power plants now being installed distribute low voltage alternating current directly to the lamps and motors, thus avoiding the expensive rotary converter substations.

Patented Shaper Features.—In an article printed on August 28 describing new features of the shaper built by Gould & Eberhardt of Newark, N. J. Mention should have been made of the fact that the devices described are patented.

Iron and Steel Situation in Scotland.

American Steel Orders Exaggerated.

GLASGOW, August 22, 1902.—The reports of the stoppage of more furnaces and of continued scarcity of crude iron on your side have considerably strengthened our markets. At the same time the statements current as to the extent of the orders received from America are to be received with a grain of salt. For instance, a New York correspondent of an English newspaper cabled a few days ago that an order for 80,000 tons of manufactured iron and steel had been placed by the New York Shipbuilding Company with the Lanarkshire Steel Company of Glasgow. This is a tolerably big lot even for the New York Shipbuilding Company. But it so happens that the Lanarkshire Steel Company do not make iron at all, nor do they roll ship plates. "Some one has blundered." Orders for steel material in various forms have certainly been received here by several firms during the last few weeks, but the total divided among them cannot exceed, say, 50,000 tons. That, of course, is a fairish lot of steel, and the orders have been not unwelcome at a time of comparatively languid demand from other quarters, but it is nothing to make a fuss about. Recently our steel makers reduced the price of ship plates to £6 per ton, less 5 per cent., not so much because of any extra pressure of demand as because of the advancing tendency in raw material. At the same time iron crown bars were advanced 5 shillings per ton. But there is no great enthusiastic desire on the part of buyers to pay the advances, especially as very low quotations are still reported from Germany. Steel angles are quoted here £5 12s. 6d., and boiler plates £7 10s., less 5 per cent. As a rule our steel makers are pretty fully employed, and so also are many of our finished iron manufacturers, while others could take on a good deal more work than they have. Boiler makers and pipe founders are especially busy, but tube makers are not overburdened with orders.

Small Stocks of Pig Iron.

The American demand for crude iron is having much more effect on us than the demand for the finished and partly finished material. This is because our reserves are so small and our current output is not in excess of the ordinary demand. Several thousand tons of pig have had to be withdrawn from the warrant stores at Middlesbro in order to make up cargoes for shipment to America, and some quantity has also been withdrawn from the Glasgow stores. But in Glasgow we have less than 43,000 tons in store, only a small portion of which is really available, and most of the Cleveland stock is said to be held on American account. In any case warrants are firmly held, and those who sold short a few weeks ago in the belief that the anthracite strike was over and that the American demand was about to fizzle out are beginning to feel very sorry for themselves. A number of the three months bear sales will mature next month, and the prospect is not pleasing for the sellers, for warrants with some slight occasional reactions continue to advance steadily. While I write Scotch warrants are 57 shillings 6 pence, Cleveland 52 shillings 9 pence and Cumberland hematite 60 shillings 9 pence. Middlesbro hematite pig is fetching 57 shillings for early delivery, mixed numbers, and Scotch hematite is 61 shillings 6 pence to steel works. There is, however, little movement in warrants, except in the way of closing acounts, as bears are stuck and the outlook is too uncertain to encourage bulls. The stocks in the public stores to-day are 129,000 tons at Middlesbro, 42,600 tons at Glasgow and 24,000 tons in Cumberland. Although the margin between Cleveland and Scotch iron is so narrow we are still importing a large quantity of the former into Scotland. For the year to date we have imported 45,000 tons more than in the corresponding period of last year, and this figure pretty nearly represents the increase in our exports. But then we have had in several cargoes from Nova Scotia, and there are now 87 furnaces in blast in Scotland, as compared with 76 a year ago.

Pig Iron Exports.

In Cleveland there is a distinct scarcity of makers' iron and considerable difficulty in filling up steamers as they come on the berth for contract deliveries. This is remarkable considering the enormous falling off in the German demand, for Germany is mostly supplied. In the first six months of the year the shipments to Germany (including those sent via Holland and Belgium, as well as direct) were only 108,860 tons, as compared with 225,000 tons last year, and with 520,000 tons in 1900. That is from all ports, but Cleveland and Scotland supply the major portion. It cannot be said that America has made up for this shortfall, for in the six months we sent only 81,900 tons to the United States and 12,110 tons to Canada, as compared with 20,100 tons and 2377 tons, respectively. The July shipments, however, reduced the difference, for in that month the United States took 52,192 tons and Canada 3936 tons, as compared with 3293 and 240 tons, respectively, in July, 1901. It is computed that there are now 50,000 tons of pig iron under order for shipment to the United States ports, as soon as freight can be obtained. It is of course impossible to check this figure, but the liners are certainly booked ahead for as much as they can take and inquiries are in the market for steamers for special loading. One steamer has just been chartered to load pig iron at Middlesbro for Montreal—an abnormal occurrence.

Along with the increase in our shipments to the United States should be placed the decrease in our imports from that quarter. In the first six months of last year these amounted to 27,167 tons and in the first six months of this year they were only 6736 tons. It seems odd that you should be sending any pig iron at all this week considering the scarcity of iron on your side, but presumably this small lot was of some special quality sold before the pressure began. Reports reach us here of great and growing scarcity of pig iron in the Midlands of England, where smelters are not only experiencing some American demand direct, but are called upon to supply some of the gaps left in our home markets by the diversion of North of England pig to America. It is evident that we are sailing pretty close to the wind when so moderate a flow of orders from your side can so upset the regular avenues of trade.

The Shipbuilding Industry.

Although the shipbuilding industry in general is inclined to dullness that in Scotland in particular is tolerably busy. The trade unions are taking a rather pessimistic view of the future. The Society of Boilermakers and Iron Shipbuilders, for instance, in their August report declare their opinion that there is no good ground for believing that the third quarter of the year will show any improvement. "The vast amount of shipbuilding accomplished during the last six years," they say, "must have its influence on the future, and if an increase of trade does take place it is more likely to be of a fleeting character." And to their members, the shipyard workers, the council of the society say: "It is better to face the matter and make up our minds that the feverish activity that characterized the trade during the two or three years prior to the close of 1901 is not likely to be again witnessed in the near future. A steadying influence of London freights is leavening the trade, and the moral of it is husband your resources and be prepared to meet the future, whatever may be its joys or ills." However this may apply to England there does not seem much cause for despondency in Scotland. I estimate that the Scotch shipbuilders have now quite as much work on hand as they had at the beginning of the year, and yet the summer is not usually a prolific time in new ship contracts. As a rule the busiest period for contracting is between August and November. The output of July was a comparatively small one—only 32,000 tons—but July is very much of a holiday month in Scotland, and in the shipbuilding industry cannot be regarded as containing much more than two working weeks. But in July the new contracts booked exceeded 45,000 tons. A feature of the new orders is a large proportion of cargo boats. It looks as if "tramp" owners had made up their minds to wait no longer in the hope of lower prices, and are now going to build in the expectation that general trade and the freight markets will be in an improved condition before any vessels now laid down can be ready for

business. I fear they are "too previous," considering that 90,000 tons net were added to the British register last month, after deductions by wreck, breakage, &c. That, however, is the concern of the shipowner. What the shipbuilder and the steel maker have in prospect is the probability of renewed activity in the building of cargo boats in the near future in addition to what may be called the normal demands of the regular lines. But steel makers and iron manufacturers are troubled at the high and advancing prices of crude iron, and they can see no prospect of lower prices for pig iron so long as the situation remains as it is in America and our reserves are being depleted.

Labor Troubles in the Coal Trade.

The coal difficulty is with us again. Three months ago the coal owners wished to reduce wages by 12½ per cent. on the 1888 standard—that is, to change by about 6 pence per day. The question came before the reconstituted Board of Conciliation, who could not agree, and who called in a neutral chairman (Sheriff Jameson) to act as arbiter. He split the difference, and awarded a reduction of 3 pence per day, as from the middle of July. This pleased neither side, and meanwhile the coal market has gone flatter. The coal masters have now applied for a second reduction of 3 pence to complete their original demand. Again the Conciliation Board are unable to agree and the matter is being referred to a ballot of the miners in their several districts. No serious trouble is anticipated, but the controversy unsettles the trade and makes consumers uneasy. While coal prices have been steadily receding the shipments from Scotch ports have been increasing and are now 500,000 tons ahead of the corresponding portion of last year. B. T.

The White Star steamer "Cedric," launched last week from the Harland & Wolff shipyard at Belfast, Ireland, is claimed to be the biggest ship afloat. While slightly less in length than the "Oceanic" of the same line, the "Cedric" is 4000 tons the heavier of the two and she exceeds her sister vessel, the "Celtic," by 100 tons. The length of the "Cedric" is 700 feet, her beam is 75 feet, her depth 49½ feet, and her gross tonnage 21,000 tons. Her displacement at her load draft will be 37,870 tons. She will have nine decks and accommodations for 3000 passengers and a crew of 350. She will probably be completed to take her place on the Liverpool and New York service late in the autumn.

The fire loss of the United States and Canada for the month of August, compiled by the New York *Journal of Commerce*, is placed at $7,425,550, or about $1,000,000 below the amount charged against August, 1901, and $3,000,000 less than the loss of July, 1902. August has given the underwriters a welcome relief after the unusually severe tale of losses of last winter and spring. For the eight months ending with August 31, 1902, the aggregate of fire losses is $104,559,000, against $113,000,000 for the corresponding period of 1901 and $127,206,000 for the first eight months of 1900.

The tin mill workers at the American Tin Plate Company's Works, at Chester, W. Va., which is a non-union plant, have adopted a new scale, which increases the limit of output to 11,000 pounds per turn. The regular Amalgamated scale of wages is paid at the plant, but by the new arrangement the men are enabled to make better wages than the men at the plants controlled by the Amalgamated Association, as the limit of output per turn is about 1 ton greater.

The scarcity of freight transportation facilities has caused the Pennsylvania Railroad to place orders for 1500 freight cars, the majority of which are to be 100,000 pounds capacity and the remainder of 80,000 pounds.

Chinese tin has lately appeared upon the London market. Recent market reports state that a fair business has been done in tin from the Province of Yunnan, China.

Pacific Coast News.

SAN FRANCISCO, CAL., September 1, 1902.—Matters in trade circles have been quite lively since the middle of August. The fall trade has set in well and for the next three months the hardware and metal trades look for the best times that they have had for the past ten years. The harvest in this State is completely over and another week will see the crops of Oregon and Washington gathered in. Wheat, the great crop of the coast, will not be as large a crop as expected in the two northern States, but in California it is fully up to the mark, and taking in the coast as a whole there will be at least 1,300,000 tons for exportation to Great Britain and the Orient, of which California will ship the greatest part. But what Oregon and Washington may lack in wheat they will make up in lumber, which to-day in all three States pays better than wheat, fruit or anything else that the producer in large quantity has to sell. For instance, redwood for export—that is, rough clear—has advanced in a year from $18 to $25 per 1000 feet. And although Oregon pine, or, as it it is called for Eastern consumption, Douglas fir, has not advanced in an equal ratio, the mill men are quite well satisfied with the outlook. The sugar and white pine people have been equally fortunate and have begun to ship overland via New York to England. So no matter where the dealer in hardware, iron or steel turns his attention on this coast there is a good market for him.

Something of a lull in the building trade has come, although I think that it will only prove to be temporary, and this is looked to as lessening the demand for nails, building hardware, &c. Of course this refers to the large towns, but as the country people will now begin to put in their improvements I look to see any loss from this more than made up.

The one really unsatisfactory feature of the situation is the impossibility of obtaining sufficient structural steel for the great buildings now being erected. In some of them operations have about come to a standstill, and this causes more than one of our capitalists to regret that we are dependent on Eastern sources for our supplies of what is at present so indispensable an article. Many have thought seriously of establishing a steel plant on San Francisco Bay, and, in fact, I understand that such a proposition is now being entertained. But with local capitalists at least the possibility of a strike is more or less of a deterrent, and I should not wonder if that had not a good deal to do in bringing managers of the Union Iron Works into the great shipbuilding combine.

The great event of the week has been the departure of the immense freighter "Korea," the largest vessel ever seen in this port, for the Orient. She cleared on Saturday, August 31, and sailed on the same day. She had a merchandise cargo valued at $615,071. Perhaps the principal matter of interest for *The Iron Age* is the fact that she carried for Vladivostock, Asiatic Russia, 2388 packages of caissons valued at $140,000 and 58 packages of plows valued at $4000. She had, besides, bicycles, $4217; watch movements, $2894, for Japan; pumping machinery, $2082, for China; nails, 500 kegs, $1350, the first in quite a while for Japan; hardware, $1765, most of it for Korea, and machinery, $4270, for Japan, and $350 worth for Manila. The Oriental freighters of the future between this city and the Orient will be vessels like the "Korea." The "Barradouta" on August 23 had for Central American and Mexican ports machinery valued at $6422, and pipe $450. The "Alameda" on the same date had machinery for Honolulu, $4964, and bicycles, $681. There have also been shipments to Alaska. But here we have about arrived at the end of our tether for the season as far as shipments by sea are concerned.

J. O. L.

From the Commercial Club of Indianapolis comes the information that a company have been organized in Chicago who have leased the rolling mill of the Premier Steel Works on Merrill street, Indianapolis. It is expected that the mill will be ready for operation within two months and will give employment to 100 men.

Lake Ore Matters.

DULUTH, MINN., September 6, 1902.—Iron ore shipments from the upper lake region for August were about 4,000,000 tons, of which Minnesota furnished 2,400,000 tons. Shipments from all ports, except Escanaba, for the month and season in this and preceding years have been as follows, in gross tons:

	All Lake Superior.		Minnesota.	
Year.	Season to September.	Month of August.	Season to September.	Month of August.
1899.....	8,091,575	2,280,000	4,865,000	1,457,000
1900.....	9,838,700	2,286,000	6,306,000	1,474,000
1901.....	9,790,000	2,920,000	6,620,600	1,852,000
1902.....	13,642,500	3,295,900	9,719,600	2,398,000

The Duluth, Missabe & Northern road, with docks at this city, again led all other roads with a total business for the month of 948,000 tons. This year the ore from mines tributary to that road has been in greater demand than before, resulting in a corresponding gain of shipments to the relative loss of other lines.

Records in Ore Handling.

Some big ore handling records have recently been made, both by the Hulett ore unloaders in use at Conneaut and the Hoover & Mason scoop in use at South Chicago. The steamship "James H. Hoyt," referred to in this correspondence on July 24, has been a determining assistance in these records on account of her peculiarities of deck construction. In that article, by the way, the cost of Hulett unloaders was given as about $40,000. The figure should have been between $50,000 and $60,000, as *The Iron Age* is informed by the makers, Webster, Camp & Lane, and it is probable that the machines could not be duplicated to-day at less than a considerable advance over these figures. The makers also state that they are not building their machines for installation this year at any other dock than that of the Lackawanna Steel Company, Buffalo. But it is probable that they, or other labor saving machines, will be installed at several other lower lake docks as soon as practicable, perhaps next year. The "Hoyt" was so completely unloaded by these machines at Conneaut that no shovelers were introduced into the ship, and she left for the upper lakes carrying back the small percentage of ore left after the clam shells were through, thus bearing out the expectation of her builders, as noted in the correspondence in question.

At the new docks of the Illinois Steel Company at South Chicago, where the Hoover & Mason system is installed, the "Hoyt" was unloaded at the rate of nearly 1000 tons per hour, cleaning out very nearly the whole cargo in considerably less than six hours.

The reduction in time of discharging cargoes gained by these new unloading devices will have the same effect upon the seasonal ore carrying capacity of the great lakes as would the construction of 50 large ships, operated as has been customary. Their importance is therefore no small thing, and the vessel interests of the lakes are watching them with the most lively interest. So far the "Hoyt" is the only ship yet built that has hatch openings spaced 12 feet centers, and able therefore to take advantage of complete unloading by the new methods, but four other vessels are now under way that will be similarly spaced. The problem for shipbuilders is to so strengthen their vessels that they will not be structurally too weak, while having the deck practically cut away as in the "Hoyt." But the bracing system worked out in that vessel, and to be followed with more or less modifications in others, is thought by the best builders on the lakes to remove any possibility of criticism. Indeed, it would not appear to make very much difference in longitudinal strength, at least, whether a deck is pierced by a dozen hatches or by 20.

Mesaba News.

Floating newspaper items give the United States Steel Corporation credit for ordering 12 steam shovels for next year's work. The order will be for eight, each of about 90 tons weight and of standard type. It is to be placed in a few days, probably next week. Orders for additional engine and machinery equipment for the mining department are soon to be placed by the offices at Duluth.

Pickands, Mather & Co. have taken an option on the Elizabeth mine, in section 12-57-21, and are now testing the previous drillings. It is very probable that they will take over the mine at the option price, $350,000. This is a State lease and contains so far, as now shown, 11,700,000 tons of ore averaging 58 per cent. in iron. Much of it is non-Bessemer and the mine may be expected to be quite wet, but there is opportunity for the finding of considerably larger tonnage by more complete exploration. The royalty will be 25 cents direct to the State and the minimum is the State's usual very reasonable amount, 5000 tons annually. This Cleveland firm have been especially active on the Mesaba range this year in the taking of new properties, having now taken three besides the Elizabeth, all of which are being opened. These are the Troy, Albany and Utica. The Troy is south of Fayal, in the northwest part of T 57-17. It is now being opened by a shaft. The Albany is just northeast of Hibbing and is also being opened by a shaft. It contains a very deep ore body, with one hole 418 feet in ore, and should ultimately prove to be a large mine. Earlier estimates of the deposit shown up were for about 4,000,000 tons, averaging 58.67 iron and 0.071 phosphorus. The ore is of good structure. The Utica covers 60 acres southwest of Hibbing, about a mile, and contains some 4,000,000 tons of good ore. Some of the deposit is quite close to surface. In addition to these properties the same firm have the Sparta, Malta, Corsica and Elba, all good mines, that should this year ship about 800,000 tons. They have also opened this year the Minorca, lying north of Virginia, and will make a shipment of about 30,000 tons there. All these mines are high grade Bessemer properties. Their work on the Menominee and Gogebic is quite extensive and will show a very much larger production than in any preceding season.

The Shenango Furnace Company and the Clairton Steel Company have opened an office at Duluth, in charge of W. A. Barrows, Jr., to care for their large and growing interests on the Mesaba range. They are opening properties for mining and have a considerable tonnage of unopened ores there.

Notes on Other Ranges.

J. R. Thompson, who has been superintendent of Schlesinger mines on the Gogebic, has made a careful inspection of the Yale mine at Bessemer and has taken the position of manager. The Yale was formerly the old valley mine, which was, up to the time the Ashland Iron & Steel Company took hold of it, practically an unknown proposition. It lies between the Newport and Colby, in a vicinity where there were several abandoned prospects, many of which are turning out well, and Mr. Thompson is of the opinion that it has the making of a large mine. There was an old shaft sunk before 1897 that reached a depth of 300 feet. Work of the past year has been extensive and a large deposit of fine ore has been opened. The large air compressor at Tilden will be moved to the Savoy mine, Vermillion range, and be replaced by a smaller one.

A shaft will be sunk to mine 1, old Winthrop open pit, at Ishpeming by the milling system. Two of these pits have been operated the present year and the output is quite large. A large new air compressor will be installed to operate the new shaft and section 21 mine of the Lake Superior Iron Company.

The town site of Crystal Falls is once more to be explored and it would not be surprising if a good deposit might be found. Dr. Kimball, who was interested in this work 18 years ago, is at the head of the present enterprise. The Bristol mine is shipping steadily to Minerva furnace of the Thomas Furnace Company, Milwaukee. At the Forest mine a find of high grade Bessemer ore is said to have been made.

Another great purchase of hard wood lands has been made by the Cleveland Cliffs Company, this time 1,000,000 acres belonging to the Detroit, Mackinaw & Marquette road. These lands lie near the line of the iron company's new roads and will be utilized in their

extensive plans for future development. The company now hold more than 1,500,000 acres of timbered hard wood lands east and south of Marquette.

There were many unemployed men in the lake copper country, but most of them are finding employment in the iron regions and elsewhere in mining fields.

D. E. W.

The Lovell Window and Shutter Operating Device.

The device which has recently been brought out by the G. Drouve Company, Bridgeport, Conn., for operating sashes and shutters is adapted to operating a line of sash 500 feet long from one station, if desired. Illustrations are presented herewith of the device as attached to a line of sash, and of the principal parts which compose it. The apparatus is stated to work equally well with sash hung from the top, pivoted at the sides, pivoted at the top or bottom, or hinged at the bottom. It can also be applied to sliding or ordinary lifting windows. Fig. 1 shows the device as applied to a row of windows. The photograph from which this illustration has been made shows a line of 320 feet of sash operated from one station just erected in a Bridgeport factory.

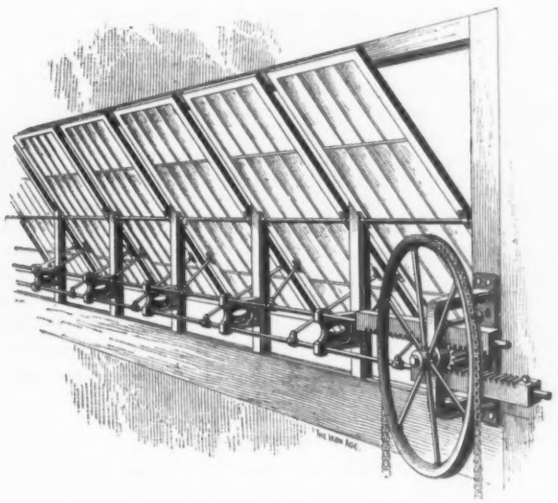


Fig. 1.—The Device Applied to a Row of Windows.

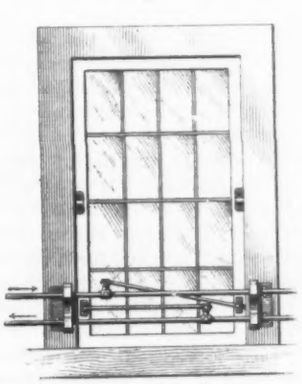


Fig. 2.—Front Elevation of One Window Closed.

The movements of the sash are effected by two rods actuated by a pinion and rack, so that a turn of the wheel moves one of the rods forward and the other backward. Link arms connect the operating rods to the sash. When the windows are elevated, as for instance in a lantern on the top of a building, a chain passing around the wheel enables it to be easily operated from any point below. Fig. 2 is a front elevation of one of the windows closed, with the link arms attached to the rods and sash. The arrows show the direction in which the operating rods are adapted to move. Fig. 3 represents one of the adjustable hangers for supporting the operating rods. The openings are so arranged that the hanger can be fastened through holes in the foot or in the face to meet the requirements of the position in which it is to be attached. It is constructed in two parts connected at the center by bolts which permit adjustment to a reasonable length. The operating rods pass through the two square openings at the left of the hanger and are supported by anti-friction rollers. Fig. 4 shows a broken view of one of the link arms which connect the operating rods to the sash. The forward end of this link arm is pivotally supported to a clip which is swiveled to the sash plate. The other end of the link arm is swiveled on a headed pin, which also pivotally connects the arm link to a clip swiveled on a collar, through which the operating rod passes. The collar is secured to the operating rod by a set screw.

The operating station for an entire building can be placed on a wall at the end or side of the building. In case of fire the windows can then be quickly closed while the occupants are leaving the building. This is a feature which appeals to the owners of factories and mills. The company have taken contracts for the installation of the apparatus in a number of large buildings both in the East and West.

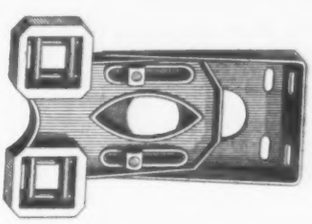


Fig. 3.—Adjustable Hanger to Support Operating Rods.

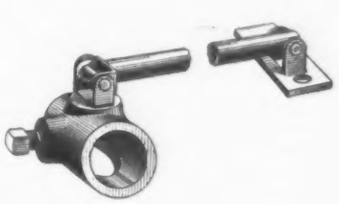


Fig. 4.—Broken View of Link Arm Connecting Sash Plate with Operating Rod.

THE LOVELL WINDOW OPENING DEVICE.

Clairton Steel Company.—On Monday, September 8, four of the new open hearth furnaces of the St. Clair Steel Company, at Clairton, Pa., were put in operation. The plant is to eventually contain 12 50-ton open hearth furnaces, but the balance of these will not be ready for some time. The supply of pig iron for the present will be purchased in the open market, but after the first of the year the St. Clair Furnace Company will supply pig iron to the St. Clair Steel Company of America. The greater part of the output of the steel made by the St. Clair Steel Company will be used in the finishing mills of the Crucible Steel Company of America. It is probable that a Bessemer plant will also be added at some time in the future.

The American Steel & Wire Company made export shipments in August of nearly 8000 tons of wire and wire nails. The wire exports aggregated over 5000 tons, South Africa, Australia and South America being the largest buyers.

The Production of Natural Gas in 1901.

Pressure Diminishing But Consumption Increasing.

WASHINGTON, D. C., September 8, 1902.—The annual report of the United States Geological Survey on the production of natural gas, which has just been completed by F. H. Oliphant, shows that the value of this product consumed in the United States in 1901 was $27,067,500, representing approximately 169,172,000,000 cubic feet at 15 cents per 1000 feet. This is an increase in value over the product of 1900 of $3,368,826. Although the consumption of natural gas steadily increases, the pressure, except in the new fields of West Virginia, has continued to decline, necessitating the expense of compression in order to market an increased production from the declining fields, which expense must continue to enhance as the pressure declines and the distance to the source of supply increases. There was an important increase in 1900 in the number of iron and steel works employing natural gas as fuel, the total having risen from 83 such establishments in 1900 to 102 in 1901, a large majority being located in Pennsylvania.

Capital Still Being Attracted to Natural Gas.

During the year 1901 there was an unusual amount of consolidation of the older companies marketing natural gas, and there were organized also a number of new companies with large capital, with a view, chiefly, of utilizing the great areas of high pressure gas territory in Lewis, Harrison, Marion and Wetzel counties of West Virginia by the construction of larger and longer pipe lines, so as to market this increased production in Western Pennsylvania and Ohio. This involves an outlay of many millions of capital.

As a source of heat, light and power, natural gas is unexcelled from the moment it reaches the surface of the earth at the mouth of the well until it reaches the furthest consumer at the end of the pipe line. No preparation is necessary for its combustion, and no residue is left. It needs only to be mixed with the proper amount of oxygen. These are the facts that have stimulated capitalists to invest the money necessary to develop the reservoirs of the natural gas fields that are still holding their original pressure and volume. These capitalists are building hundreds of miles of larger lines in order to supply the towns and cities formerly supplied by nearer but now exhausted fields, and also to supply other cities that have never known the blessings of natural gas.

It has been supplying the power for a very large number of factories and operations in the gas belt, and lately it has been extensively applied in creating the power by which the natural gas itself is compressed from a low to a high pressure when the original pressure has failed and the pipes are insufficient to deliver the necessary quantity of gas at the well pressure. A number of these compressors work up very close to 1000 horsepower, with an economy that enables 8 to 10 cubic feet of natural gas to develop a horse-power for an hour, a saving of from 40 to 50 per cent. over high duty steam engines.

The State of West Virginia has for several years furnished an increasing quantity of natural gas to Pennsylvania and Ohio; yet there still remain under the domes and arches of its rugged hills great reservoirs of it that have only been sufficiently tested by the drill to prove their existence. These reservoirs are being connected by additional lines of large pipe, and will shortly supply larger quantities to localities in these States that have exhausted their own nearer reservoirs, and now turn to West Virginia for a continuation of their supply.

Comparison of Values.

The value of the natural gas sold in 1901 was greater than that of any previous year, though the quantity was greatly exceeded when it was first introduced extensively from about 1883 to the close of 1889. During this period of six years it was used in the most extravagant and reckless manner, and it was paid for at rates that were in many instances less than one-half the price of the equivalent coal. Large quantities were allowed to escape and burn from the mouths of hundreds of stand pipes from Saturday afternoon until Monday morning. It is highly probable that in these six years of reckless consumption four times the present production was consumed annually.

As the visible supply grew less the value became more apparent, and the appliances for consuming the gas were greatly improved after the introduction of the meter. The pipe line companies adopted more advanced methods, in securing better joints, in shutting off wells that were not needed to keep up the pressure in the mains, and in manipulating the wells themselves. By the extension of lines into newer territory they have been enabled to market increasing quantities at enhanced prices since the years 1895 and 1896, in each of which years only $13,000,000 worth of gas was sold.

The value of the natural gas consumed in the United States in 1901 was $27,067,500, which, at 15 cents per 1000 cubic feet, is equivalent to 169,172,000,000 cubic feet. If it were possible to store this gas in a cube, the density throughout being equal, its sides would be 5530 feet in length or 250 feet greater than the sides of a cubic mile. If 20,000 cubic feet of natural gas be taken to equal 1 ton of coal, 8,458,600 tons of coal, valued at $3.20 per ton, would be required to yield the sum of money for which the natural gas sold. The value of the production for 1904 was greater than that of 1900 by $3,368,826, or over 14 per cent. It exceeded that of 1899 by $6,992,027. It may also be interesting to note that the value of the 69,389,194 barrels of petroleum produced in the United States during 1901 was $66,417,335, and that the value of the natural gas amounted to 40.7 per cent. of the value of the petroleum for the same year.

Statistics.

There were 10,293 wells producing natural gas at the close of 1901, of which number 74 were not turned into the gas mains, and 2088 producing wells were drilled in the same year; there were 453 dry holes, or nonproducers, and 1084 were abandoned. In 1900 there were 9738 producing wells, of which number 24 were shut in; 1759 wells were drilled in the same year, 359 were dry holes and 991 were abandoned. There were very nearly 800 miles of pipe laid during 1901, the mains varying from 2 up to 20 inches. This brought the total up to 21,848 miles of natural gas mains of from 2 to 36 inches in diameter in use at the close of 1901.

The increase in the value of the output of natural gas in 1901 is due principally to increased production, the advance in the general price being very slight, and is not due so much to the output from the recently developed fields in Southwestern Pennsylvania and Central West Virginia as to the enlarging of lines and the installation of gas compressors. It is this that has kept up the quantity marketed in Indiana to about the average of former years, although the rock pressure has very largely decreased. Kansas, however, has increased the value of natural gas marketed both by developing new territory and by exploiting more thoroughly that which was already known. The value of the gas produced in each State is credited to it, although Pennsylvania furnished natural gas to Ohio, New York, and West Virginia; West Virginia furnished gas to Pennsylvania and Ohio; Indiana furnished gas to Ohio and Illinois, and Kentucky furnished gas to Ohio and West Virginia. These complications require a careful tabulation of the values so that each State shall receive its proper credit. The following figures show the output of natural gas in 1901 by States: California, $67,692; Colorado, $1,800; Illinois, $1,825; Indiana, $6,954,566; Kansas, $659,173; Kentucky, $270,871; Missouri, $1328; New York, $293,232; Ohio, $2,147,215; Pennsylvania, $12,688,161; Texas, $7255; South Dakota, $20,000; West Virginia, $3,954,472; total, $27,067,500.

Notwithstanding all the care exercised in the collection and distribution of the statistics, there is a very considerable amount of natural gas consumed of which no account is rendered, as it is used universally in the oil fields for pumping wells, both in the gas engine and under the boilers, for driving gas compressors, and for supplying farmhouses and many operators in the field. There are instances, which reach from northern Central New York to Eastern Illinois, where single wells supply

one or two houses, so that if it were possible to secure a complete return of the value of all the fuel displaced the figures presented would be increased by at least 10 per cent.

The following figures show the number of producing companies or individuals during 1901: Pennsylvania, 296; Indiana, 656; Ohio, 305; West Virginia, 44; New York, 114; Kansas, 48; Kentucky, 26; California, 12; Texas, 2; South Dakota, 3; Illinois, 22; Colorado, 2; Missouri, 15; total, 1545.

A total of 5742 manufacturing establishments employed gas as fuel during 1901, of which 102 were iron and steel works, 219 glass works, and 5421 engaged in other industries. The iron and steel works were distributed by States as follows: Pennsylvania, 82; Indiana, 1; Ohio, 6; West Virginia, 2; Kentucky, 1.

W. L. C.

Some Instructive Comparisons.

BY S. G. HOBSON.

A valuable memorandum has just been issued by the British Board of Trade, giving the comparative statistics of population, industry and commerce in the United Kingdom, America, Germany and France. As an up to date general statement of the relative commercial positions of the four great industrial nations this memorandum "fills the bill."

Comparisons, we are told on high authority, are odious, but they are none the less necessary. It is astonishing what misconceptions arise in the minds of even the most acute observers as to international trade currents and trade magnitudes. This memorandum constitutes an excellent corrective. There is a good deal of meat to be obtained from what are the apparently dry bones of population statistics, and no thoughtful person can come to any definite conclusion upon the relative increases in trade of the various countries unless he has first of all a clear conception of the growth or otherwise in population. It is well to remember, therefore, that during the last 30 years there has been an increase of 10,000,000 in the population of Great Britain; during the same period the French increase has been under 3,000,000, the German increase exceeds 15,000,000, the American increase amounts to no less than 37,000,000. More interesting is the statement as to the tendencies of populations to drift to the towns. Thus, in France since 1846 the proportion of urban to total population has advanced from 24.4 to 40 per cent. In Germany since 1871 the proportion has gone up from 36.1 to 54.3 per cent., while for the United States, in spite of its large agricultural areas, the increase of urban population as well as its proportion to the whole is most significant. In 1790 the proportion of urban to total population in the United States was only 3.35 per cent. In 1870, after the war, it was 20.93 per cent., and in 1900, 33.11 per cent. When we come to the production of raw material in the various countries we begin to see more clearly how things are going. Take, for example, the quantity of coal produced. The following table shows with fair exactitude where we are. It is followed by a second table showing the estimated quantity of coal consumed:

Quantity of Coal Produced.

	Annual average in			Increase in 1890-94 over 1870-74.		Increase in 1896-1900 over 1870-74.	
	1870-1874.	1890-1894.	1896-1900.	Amount.		Amount.	
	Million tons.	Million tons.	Million tons.	Million tons.	Per cent.	Million tons.	Per cent.
U. Kingdom	120	180	209	60	50.0	89	74.2
France	15	26	31	11	73.3	16	106.7
Germany	32	73	97	41	128.1	65	203.1
U. States	42	153	203	111	264.3	161	383.3

Estimated Quantity of Coal Consumed.

	1883.	1900.	Increase, 1900 over 1883. Amount.	
	Million tons.	Million tons.	Million tons.	Per cent.
United Kingdom	134	167	33	24.6
France	31	46	15	48.4
Germany	49	99	50	102.0
United States	102.5	235	132.5	129.3

The next comparison is that of pig iron, arranged on the same basis as that of coal:

Quantity of Pig Iron Produced.

	Annual average in			Increase in 1890-94 over 1870-74.		Increase in 1896-1900 over 1870-74.	
	1870-1874.	1890-1894.	1896-1900.	Amount.		Amount.	
	Million tons.	Million tons.	Million tons.	Million tons.	Per cent.	Million tons.	Per cent.
U. Kingdom	6.4	7.3	8.9	0.9	14.1	2.5	39.1
France	1.2	2.0	2.5	0.8	66.7	1.3	108.3
Germany	1.8	4.9	7.4	3.1	172.2	5.6	311.1
U. States	2.2	8.1	11.5	5.9	268.2	9.3	422.7

Even yet more interesting is the average annual production of pig iron in the United Kingdom and the other countries per head of the population:

Pig Iron Production Per Head of the Population.

Average of period.	U. Kingdom. Ton.	France. Ton.	Germany. Ton.	U. States. Ton.
1855-59	0.13	0.02	No information.	0.02
1860-64	0.14	0.03	0.02	0.03
1865-69	0.16	0.03	0.03	0.03
1870-74	0.20	0.03	0.04	0.06
1875-79	0.19	0.04	0.05	0.05
1880-84	0.23	0.05	0.07	0.08
1885-89	0.21	0.04	0.08	0.11
1890-94	0.19	0.05	0.10	0.13
1895-99	0.22	0.06	0.13	0.15

Coming now to the exports and imports of the four countries under comparison we extract a few of the figures given in the memorandum:

Comparison of the Annual Exports.

	U. Kingdom.	France.	Germany.	U. States.
1880	£223,000,000	£139,000,000	£145,000,000	£172,000,000
1885	213,000,000	124,000,000	143,000,000	151,000,000
1890	263,000,000	150,000,000	166,000,000	176,000,000
1895	226,000,000	135,000,000	166,000,000	165,000,000
1896	240,000,000	136,000,000	176,000,000	180,000,000
1897	234,000,000	144,000,000	176,000,000	215,000,000
1898	233,000,000	140,000,000	181,000,000	252,000,000
1899	255,000,000	166,000,000	203,000,000	251,000,000
1900	283,000,000	164,000,000	222,000,000	286,000,000

Five Years' Averages Compared.

	Average.		Increase.	
	1880-84.	1896-1900.	Amount.	Per cent.
United Kingdom	£234,000,000	£249,000,000	£15,000,000	6.4
France	138,000,000	150,000,000	12,000,000	8.7
Germany	156,000,000	192,000,000	36,000,000	23.1
United States	166,000,000	237,000,000	71,000,000	42.8

Annual Exports Per Head of the Population.

Average of period.	U. Kingdom. £ s. d.	France. £ s. d.	Germany. £ s. d.	U. States. £ s. d.
1870-74	7 7 3	3 15 0	2 16 7	2 9 11
1875-79	6 0 0	3 14 11	3 3 0	2 16 3
1880-84	6 13 2	3 13 5	3 8 8	3 5 11
1885-89	6 3 8	3 9 3	3 5 6	2 11 10
1890-94	6 2 11	3 11 4	3 2 9	2 19 0
1895-99	5 19 5	3 14 8	3 7 2	2 18 4

In regard to this last table it is as well to bear in mind that the period 1870-74 was exceptional, the figures being largely swollen by the special circumstances of the war between France and Germany, the payment of the French indemnity to Germany, and the boom in the British iron and coal trades at a time when railway construction abroad was brisk. The imports per head of the population for precisely the same periods must conclude this section of the subject:

Net Imports (Imports Less Re-exports) Per Head.

Average of period.	U. Kingdom. £ s. d.	France. £ s. d.	Germany. £ s. d.	U. States. £ s. d.
1870-74	9 2 4	3 15 8	4 6 3	2 18 7
1875-79	9 10 4	4 6 7	4 6 1	2 2 5
1880-84	9 15 4	5 1 4	3 8 3	2 15 7
1885-89	8 14 2	4 6 10	3 9 5	2 8 11
1890-94	9 7 3	4 8 0	4 2 2	2 11 11
1895-99	9 17 2	4 4 9	4 6 10	1 19 11

It will be seen from the foregoing that both the import and export trades in Great Britain show per head an immense preponderance over either France, Germany or the United States. The other tables, and their number is legion, which appear in this memorandum are of a more general character, and we will not quote them. It will be enough if we give the conclusion reached by Sir A. E. Bateman, who has compiled it. He says:

The increase of population in Germany and the United States has recently been greater than the increase in the United Kingdom, and those countries have rapidly developed manufacturing and industrial power. As with ourselves so with those countries, the set of population has been to the towns; necessarily, therefore, there has been a more vigorous search than formerly for an outlet for the power above referred to. We are still ahead of either country in our power of manufacture for export, but, beginning from a lower level, each country is traveling upward more rapidly than we are who occupy a higher eminence. If

peace is maintained both Germany and the United States are certain to increase their rate of upward movement. Their competition with us in neutral markets, and even in our home markets, will probably, unless we ourselves are active, become increasingly serious. Every year will add to their acquired capital and skill, and they will have larger and larger additions to their population to draw upon. It is necessary, therefore, more than ever, that the change of conditions should be recognized, and we can scarcely expect to maintain our past undoubted pre-eminence, at any rate without strenuous effort and careful and energetic improvement in method. The problem how best this can be done is of vital interest to all classes of the industrial and commercial community alike, though the assistance which the State can give in the matter must necessarily be of a limited character.

The Philadelphia Foundrymen's Association.

The one hundred and twentieth regular meeting of the Philadelphia Foundrymen's Association, the first after the usual summer vacation, was held at the Manufacturers' Club, Broad and Walnut streets, Wednesday evening, September 3. The president, Thomas I. Rankin, called the meeting to order at the usual hour, and signified his gratification at the number of familiar faces present. The attendance for the first of the fall meetings was large, among those present being the following:

Thos. I. Rankin, Abram Cox Stove Company, Philadelphia.
Thos. P. Harkins, Harkins Foundry, Bristol, Pa.
Thos. Devlin and H. O. Evans, Thos. Devlin & Co., Philadelphia.
Geo. C. Davis, chemist, Philadelphia.
Dr. E. E. Brown and C. R. Brown, E. E. Brown & Co., Philadelphia.
Frederick Spoerl, H. W. Butterworth & Son Company, Philadelphia.
Edwin Cross, Standard Steel Works, Burnham, Pa.
W. P. Cunningham, A. & P. Roberts Company, Pencoyd, Pa.
T. J. Kelley, Thomas, Roberts, Stevenson Company, Philadelphia.
Thos. Bullock, Edwin Macneir, I. H. Webster, T. L. Tierney, Julius Keller, C. R. Hewitt, Wm. H. Keller and Harry Keller, Philadelphia Pneumatic Tool Company, Philadelphia.
J. Hanthorn, Wm. Sellers & Co., Philadelphia.
Owen Brooks, Diamond Drill & Machine Company, Birdsboro, Pa.
M. H. Bickley and Adam C. Harper, Penn Steel Casting Company, Chester, Pa.
Robt. Stinson, Jr., Delaware River I. S. B. & E. Works, Chester, Pa.
Jas. B. Strain, Robt. Wetherill & Co., Chester, Pa.
T. B. Smith, Diamond Drill & Machine Company, Birdsboro, Pa.
G. M. Thompson, P. D. Harton Mach. Company, Philadelphia.
Guyon Miller, Downingtown Mfg. Company, Downingtown, Pa.
Oregon J. Ward, Howe Scale Company, Philadelphia.
Paul Vanfleet, I. A. Sheppard & Co., Philadelphia.
C. L. Taylor, Phœnix Iron Works, Hartford, Conn.
J. Henry Pepper, *Iron Trade Review*, Philadelphia.
Thos. Hobson and A. A. Miller, *The Iron Age*, Philadelphia.
J. Thompson, J. Thompson & Co., Philadelphia.
Howard Evans, J. S. Hibbs and A. G. Warren, J. W. Paxson Company, Philadelphia.

There was no business of importance before the meeting. The various committees deferred making reports. The treasurer reported a balance on hand amounting to $2077.75, with all bills paid.

The paper of the evening, by Adam C. Harper, Chester, Pa., was on the subject

"Keller Pneumatic Rammers and Air Appliances"

as manufactured by the Philadelphia Pneumatic Tool Company, from which we take the following abstract:

To-day a boiler or machine shop devoid of compressed air equipment is a rarity, and the day is near at hand when a foundry without pneumatic equipment cannot produce its output in commercial competition with foundries that have adopted it. The best known and most widely employed foundry appliance actuated by compressed air is the pneumatic rammer, principally on large molds, foundry pits and loam work.

First of all I want to tell you what we claim for this rammer. We have what we call No. 7, No. 8 and No. 9 rammers. The No. 7 is our smallest rammer for general foundry work, and is intended for ramming up flasks, peen ramming on large work, cutting out large cores, ramming concrete, tamping, &c. It can be used with one hand, the air supply being regulated in the handle by a lever, giving the workman complete control of its operation. It is light, convenient, and can be used in places where the larger size could not be comveniently handled. The rammer is so proportioned that there is very little jar while it is in operation. It is so well proportioned that the vibration of the moving parts is absorbed to a large extent by the weight of the machine. The valve and piston are entirely inclosed, and all possible care is taken to keep out the dirt. The rammer rod is hexagonal in shape, so that it cannot turn except at the will of the operator. This tool only weighs about 18 pounds, and while in operation sustains its own weight. It strikes from 350 to 500 blows per minute, using air at from 60 to 100 pounds pressure, and uses 11 cubic feet per minute.

You ask me what we claim over the old hand ramming system. Each blow of the rammer has a force of 350 pounds, whereas the blow of the workman would not average over 40 pounds, and the blows are extremely rapid and can be regulated to the exact degree of force required, and, once regulated, do not vary. In consequence a mold can be so compactly and uniformly rammed that no straining can take place when the molten metal is introduced; and a further advantage is derived in that an accurate estimate of the amount of metal required for a casting can be made beforehand which, under the defects of the old method, could not be done. It has been found from a series of tests that 15 per cent. of metal can be saved in a casting the mold for which has been rammed up by the hand method, and you know as well as I do that to be a successful molder you will have to study the principles of ramming. Years ago, when I started to learn my trade as a molder, up in the center of Pennsylvania, my old boss told me that if ever I wanted to make a successful molder I must first learn well how to handle a rammer. I never forgot that, and it stood well with me in after years.

You know so well that after a molder is ramming for a little while he becomes tired and his blows are not so many and not so powerful. There is naturally a wide variation in the force of his blows, and in consequence the mold is not rammed to a uniform firmness. This being the condition of the mold, when the metal for the casting is poured in the walls of the mold are subjected to a very considerable pressure, and the metal spreads, or, as it is called, "strains." This, of course, alters the intended shape, size and weight of the casting and necessitates the chipping or turning off of the superfluous metal to reduce the casting to its proper dimensions. It has been found in practice that the straining takes place to a greater or less extent in almost every casting the mold for which is rammed by described process. To remedy this defect the Philadelphia Pneumatic Tool Company of Philadelphia have brought out this rammer, that can do the work of from four to eight men on many kinds of molding.

I remember an instance which would fit this occasion: I spent five days in making some molds for the steps of a large building. There were on them very deep flanges, and the molds were very flimsily constructed. On the afternoon of the day that we were to cast them I had lifted off all the copes that we might place the cores in for casting, as I could not well put the cores in when molding, since they might draw dampness. Two other men further up in the shop had been steadily ramming all day on some plain copes, 8 feet by 8 feet by 12 inches deep, and after they would finish ramming one up and get it ready to turn over to finish it they would hook the traveling crane to it and swing it down the shop just over the molds. The first three they rammed all right, but on the next one, the fourth, they began to get tired and their blows became weaker and weaker. When they hoisted this one and the traveling crane was bringing it down over the shop, just as it was passing over my molds the cope began to drop, and before we could get it out of the way it had spoiled all the work I could replace in three days.

[The author here gave a number of examples of work done by the rammer in various foundries, showing the great saving in time and labor as compared with ramming by hand.]

Next we come to our No. 8 rammer. This machine is provided with a handle on each side. To the handle on the right side is attached the air supply hose, and the admission of air to the cylinder of the rammer is controlled by means of a throttle lever under the thumb of the user.

The exhaust air passes out through the handle on the opposite side. The speed and force of the blows may be varied at the will of the user. A number of different shaped rammer butts are provided with each machine. They are attached to the rammer rod by means of a taper fit, and may be changed in less than ½ minute without letting go of the handles. Besides regular foundry work, it has been found to be a labor saver in ramming up converter bottoms in Bessemer steel plants, tamping concrete road beds, &c. The No. 9 rammer is especially designed for heavy work, where a crane or some other overhead support is available, being adapted for large loam work, pit ramming, &c. This rammer will do the work of 12 or 15 men with the old style hand ramming.

You will perhaps ask the question, "What about the molders; are they prejudiced against this rammer; do they take a stand against machine molding or any other new devices?" If you have any doubt about it, read the speech of President Martin Fox, in his annual address at the Toronto convention of the Iron Molders' Union, July 7, 1902. He says, among other things: "Our original attitude toward the machine molding and air appliances, such as rammers and other equipment, was a short sighted and mistaken one, and the resulting injury to our one interest cannot be removed by a perpetuation of the early prejudice. The foundry industry is developing and our union must adapt its policy to the changing conditions or fall in decay." Great and glorious words, coming from the head of the iron molders of this country, forced to this point by existing conditions!

All our rammers are well out of the experimental stage. Several years of actual service in the most progressive foundries in the world demonstrate conclusively that the pneumatic rammer has come to stay and must be considered a highly important part of the equipment of the modern foundry. On a general line of work we have demonstrated a saving of 30 to 85 per cent. in the cost of molding.

The Philadelphia Pneumatic Tool Company, situated at Twenty-first street and Allegheny avenue, this city, with their newly appointed shops, would be glad to see you at their works and show you further just what they have accomplished in their line of tools in the short space of time that they have been in business. They employ practical molders to demonstrate these rammers and will be glad to send such a man to your foundry with a tool for this purpose. The president of these works is a young man well known to many of you, J. W. Tierney. Julius Keller, superintendent and engineer, is the inventor of all the Keller pneumatic tools.

At the conclusion of the reading of this paper lantern slides of the various rammers and other pneumatic tools were shown, and a practical demonstration as to the method of handling the smaller rammers was made by Thomas Bullock of the Philadelphia Pneumatic Tool Company, after which the meeting adjourned and the members and friends proceeded to the roof garden of the club, where luncheon was served. President Rankin, as toastmaster, called upon a number of those present for remarks, bringing out happy responses.

The Stationary Engineers.

The National Association of Stationary Engineers held their twenty-first annual convention in Boston, Mass., on September 2 to 5 inclusive. The meetings were held in the engineering building of the Massachusetts Institute of Technology. The convention was the largest and most interesting in the history of the association. About 1000 delegates and guests were in attendance. The sessions were presided over by Edward C. Jacques, the president. The secretary's report showed that in the last year the association had grown vigorously, adding 70 new branches, while eight had had their charters returned. The association now numbers 406 active branches, with a membership of 16,885. The treasurer reported the finances of the organization in a healthy condition. The total receipts for the year ending September 1, 1902, were $20,848.10; expenditures, $9,315.07, and the cash balance in bank, $13,513.88.

A feature of the meeting was an extensive exhibition of engineering appliances, which constituted the largest and most complete exhibit thus far made under the auspices of the association. A great deal of work of a routine character was performed which was not of general interest. Some of the proceedings, however, are worthy of note. Decisive action was taken against the admission of negroes as members of the association. The discussion of this subject was quite animated. Another important matter decided was the refusal of the association to permit any of its branches to affiliate with any local trades' council or other body of organized workmen. The members of the convention were opposed to having any connection with labor organizations. The convention decided to require a secretary's full time, and voted to pay that officer a salary of $1500 a year.

The election of officers occurred on the last day. Robert G. Ingleson of Cleveland, Ohio, was elected president; P. H. Hogan of Boston, vice-president; F. W. Raven of Chicago, secretary, and C. F. Raven of Milwaukee, treasurer. J. Guyer of Buffalo, N. Y., and W. Conger of Memphis, Tenn., were elected as new members of the Board of Trustees. The retiring treasurer, Daniel Delaney of Cincinnati, was presented with a gold headed cane. The next convention will be held at Evansville, Ind.

The social features of the convention were unusually enjoyable. Every care was taken to entertain the ladies, and the members were also treated to excursions in the harbor, a fish dinner, theatrical performances, &c.

The New Freight Rates on Southern Pig Iron.

We have received from the Queen & Crescent Fast Freight Line a copy of the new pig iron tariff No. 54, giving rates of freight from Southern furnaces, effective September 15. A few of the rates to prominent points are given in the following table:

To—	From Birmingham District.	From Chattanooga District.	From Dayton District.	From Sheffield District.
Albany, N. Y.	$5.98	$5.73	$5.48	$6.08
Allegheny, Pa.	4.65	4.15	3.95	4.40
Allentown, Pa.	5.52	5.27	5.02	5.62
Aurora, Ill.	4.15	3.90	3.70	3.90
Baltimore, Md.	4.76	4.51	4.26	4.86
Battle Creek, Mich.	4.40	4.15	3.95	4.15
Belleville, Ill.	3.75	3.50	3.30	3.30
Beloit, Wis.	4.55	4.20	4.10	4.20
Birdsboro, Pa.	5.22	4.97	4.72	5.32
Boston, Mass. (all rail).	6.43	6.18	5.93	6.53
(Rail and water)	4.60	4.49	4.49	...
Brazil, Ind.	3.75	3.50	3.30	3.50
Bridgeport, Conn.	6.43	6.18	5.93	6.53
Buffalo, N. Y.	4.75	4.25	4.05	4.50
Burlington, Ia.	4.15	3.90	3.70	3.90
Camden, N. J.	5.17	4.92	4.67	5.27
Chester, Pa.	4.97	4.72	4.47	5.07
Chicago, Ill.	4.15	3.90	3.70	3.90
Cincinnati, Ohio.	3.25	2.75	2.55	3.00
Conshohocken, Pa.	5.22	4.97	4.72	5.32
Detroit, Mich.	4.30	3.50	3.60	4.05
Dowagiac, Mich.	4.30	4.05	3.85	4.05
Dubuque, Iowa.	4.55	4.30	4.10	4.30
Easton, Pa.	5.52	5.27	5.02	5.62
East St. Louis, Ill.	3.75	3.50	3.30	3.30
Elizabeth, N. J.	5.57	5.32	5.07	5.67
Elkhart, Ind.	4.15	3.90	3.70	3.90
Fort Wayne, Ind.	3.95	3.70	3.50	3.70
Grand Rapids, Mich.	4.45	4.30	4.10	4.30
Harrisburg, Pa.	4.61	4.36	4.11	4.71
Harrison, N. J.	5.57	5.32	5.07	4.67
Hartford, Conn.	6.43	6.18	5.93	6.53
Indianapolis, Ind.	3.75	3.50	3.30	3.50
Jersey City, N. J. (all rail)	5.33	5.08	4.83	5.43
Joliet, Ill.	4.15	3.90	3.70	3.90
Kansas City, Mo.	5.00	5.00	4.80	...
Milwaukee, Wis.	4.55	4.30	4.10	4.30
Newark, N. J.	5.57	5.32	5.07	5.67
Newport News, Va.	3.25	3.14	3.14	...
New York (all rail)	5.94	5.69	5.44	6.04
(Rail and water)	4.25	4.14	4.14	...
Paterson, N. J.	5.98	5.73	5.48	6.08
Philadelphia, Pa. (all rail)	4.97	4.72	4.47	5.07
(Rail and water)	4.25	4.14	4.14	...
Pittsburgh, Pa.	4.65	4.15	3.95	4.40
Reading, Pa.	5.22	4.97	4.72	5.32
Rome, N. Y.	5.80	5.55	5.30	5.55
St. Paul, Minn.	5.85	5.60	5.40	5.60
Springfield, Ohio.	3.75	3.25	3.05	3.50

The Iron Age

New York, Thursday, September 11, 1902.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - - - BUSINESS MANAGER.

The Banking Reserve.

The reserve of the national banks is watched closely, especially at seasons of the year when large accommodations from the banks are likely to be needed, because of the legal requirement that these banks shall keep a reserve of 25 per cent. and stop making loans if the reserve goes below. The last statement of the Associated Banks of this city showed that their reserve above the statutory amount, or the surplus reserve, was only $4,000,000; on August 30 it was nearly $10,000,000. A year ago at this time the surplus was nearly $7,000,000 instead of just over $4,000,000, two years ago it was $26,000,000, three years ago it was under $2,500,000, four years ago it was a little larger than last year, and in 1897 it was about the same as two years ago.

As the surplus reserve diminishes the difficulty of getting loans increases, but if there were no reserve required by law and the matter was left to the judgment of the bankers a point would be reached at which the reduction of the reserve would lead to the restriction and finally to the refusal of loans. On the other hand the legal provision is not quite so rigid as is frequently represented. It is provided that if the reserve is reduced below the legal minimum the bank shall make no new loans or discounts otherwise than by purchasing or discounting bills of exchange, payable at sight, nor make any dividend of its profits, till the required proportion of reserve has been restored. The penalty for departing from this rule is that the Comptroller of the Currency "may" notify any bank whose reserve is below the legal limit to make good the deficiency, and if the bank fails to do this within 30 days the Comptroller "may," with the concurrence of the Secretary of the Treasury, put the bank in the hands of a receiver.

It will be observed that there is considerable elasticity about this provision. It is discretionary with the Comptroller, after learning that there is a deficiency in the reserve, to order the bank to make it good and the bank would then have 30 days in which to do it; if it failed to do so it would still be discretionary with the Comptroller, subject to the approval of the Secretary, whether the bank should be wound up. If the facts showed that the deficiency were due to the bad management of the bank the receivership would be resorted to if the reserve were not restored. But if the facts showed that there was a pressing demand for money from the customers of the bank, about whose solvency there was no doubt, and that the deficiency in the reserve was due to the extension of accommodations to them, it is quite safe to say that severe measures would not be resorted to. Where the weekly statement shows a very small aggregate surplus reserve it is entirely probable that individual banks have already gone below the legal limit, but no banks have been put into receiverships for this cause alone. In the panic year of 1893 there was a great scarcity of money, due largely to hoarding or to the retention of money in their own possession by merchants who were afraid to make deposits. There was a premium on currency as against checks, and a temporary currency consisting of Clearing House certificates had to be resorted to. During this period the Clearing House banks in the aggregate had a good deal less than the legal reserve for several weeks at a time. The reserve performed its function of meeting an emergency; a reserve that could not be touched at all would be of no use. The circular of a brokerage house in this city issued this week suggested that if in an emergency banks counted in their reserve national bank notes not legally available as a part of the reserve they would probably be treated leniently. But it would be in every way better for the bank to state the facts, and show that its reserve had been depleted, than to certify to a reserve which it did not actually have.

A very active demand for money here might bring gold from Europe, and gold imports were talked about early in the week, but it happens that the demand for money is strong also on the other side. It would be increased if the Transvaal loan should be issued this fall, but it is rumored that this may be put off till the special need of money in this country is over. The present conditions of the money market do not look like gold imports, but the West has more money than it ever had before, and the banks may increase their circulation somewhat, as they did last year at this season. They would be more apt to increase their circulation if the law would allow them to retire it promptly when the special need is over.

Special Export Prices.

How easily ignorance leads to absurd statements is illustrated by some of the figures given currency to prove how wickedly American manufacturers sell cheaply abroad while charging all that the market will bear at home. It is pointed out that American smelters are selling pig lead in Europe at about 2 cents per pound when they demand over 4 cents a pound from domestic consumers. The facts are these: Annually about 100,000 tons of lead are imported from Mexico and Canada, in ores and base bullion or argentiferous pig lead. The lead ore is smelted and the base bullion is desilverized in bond and nearly all of it is re-exported. The refined pig lead which American smelters and refiners are selling abroad at 2 cents per pound or over is not from mines in the United States, but is of foreign origin. If our laws did not permit of smelting in bond, the ore and base bullion would simply go to Europe and our works would lose the profit of the smelting and refining and our workmen would lose the employment. We are simply in the position of diverting the raw or partly manufactured article from its direct course to European markets and doing the finishing work here. Our smelters are selling foreign lead in its natural foreign markets and are not discriminating against the consumer in the home market.

While touching the general subject we may note another point which is overlooked in the discussion of low export prices. That is, that to a considerable extent export goods are manufactured from imported raw material on which 99 per cent. of the duty has been remitted under drawback. It is quite clear that in such cases lower prices for foreign markets do not imply discrimination against the domestic consumer.

In the case of patented articles, in which the manufacturer has a recognized monopoly at home, lower export prices may be justifiable, because the product may not be shielded against pirates in other countries in which patents were not obtained.

Finally, we have those numerous cases in which our manufacturers must meet prices in neutral markets as they find them, their competitors being engaged in dis-

posing of a surplus product in order to give work to plant and crews who would otherwise be idle. Incidentally, sacrifices so made redound to the benefit of the home consumer since they permit of covering cost of production by distributing general expenses over a larger output. Unless there is a monopoly in a particular line—and we do not know of such in the iron and steel industry—the very situation which impels export sales puts pressure on the home markets so that special inducements to exporters are only a temporary palliative. Besides, there is a check to abuses in this direction in the law which, as we understand it, allows articles of United States manufacture imported in the original packages to re-enter this country duty free.

The Anthracite Miners' Strike.

The strike of the anthracite miners is now running through its eighteenth week. It has lasted much longer than had been generally anticipated, and is therefore developing numerous features of interest. It is growing to strongly resemble the strike of the Amalgamated Association last year, in the mills of the United States Steel Corporation. In both cases the main object of the strike was to secure recognition of the union. Other points involved were far less conspicuous and by no means sufficiently prominent to constitute real grievances. In both cases it was also assumed by the strike leaders that the stock market interests of the employers were of such magnitude as to impel a speedy settlement for fear of the demoralization of the price of stocks. Again, in both cases the organization of workmen had gradually worked up to the possession of advantages which should have been deemed satisfactory for a considerable period of time or until some act on the part of the employers appeared to threaten the loss of a portion of what had been won. And now another point of strong similarity presents itself in the probability of an abrupt termination to the coal miners' strike by the act of their own leaders, who are reported to be on the point of calling it off for the purpose of saving their organization. There are always hot heads who talk of "last ditches and last crusts of bread," but their policy would be ruinous to the labor cause. They would lose the last vestige of an organization if they had their way, as men are going to work in such numbers that in the likely event of an early scramble for employment too few will be left outside to maintain it.

The leaders may deny it, but they must be seriously disheartened to think that neither Wall street influences nor political powers nor even the pressure of consumers has the slightest effect upon the attitude of the coal mining companies. Financial losses have not terrified them and threats of hostile legislation have not made them abate in the least the position originally taken by them. They have been abused by demagogues and lectured by the well meaning but misinformed in press and pulpit, yet have sturdily maintained the stand that they propose to manage their business and not have it managed for them. The public is being put to great inconvenience, important business interests are suffering, manufacturers are sadly hampered for lack of material, and in innumerable ways the strike is so affecting public and private interests that if it was possible ever to cause outside pressure to be invoked to end a strike it would in this case. But the operators maintain that they cannot yield to the men in justice to the interests they represent. It is now time for the suffering public to exert pressure on the strikers.

Some important lessons can be learned from the two great strikes of last year and this. Labor organizations can learn one lesson which may be of great benefit to them if they will heed it. That is that when great manufacturing or producing interests are confronted by a powerful labor organization it is not necessarily to be assumed that the latter can take the position of dictating terms. Convincing demonstration has been made that neither a possible decline in the stock market nor order books filled with profitable contracts will compel or induce unsatisfactory conditions to be accepted. A strike for labor supremacy has been shown by these occurrences to be most ill advised. It would have been far better for the Amalgamated Association last year or the United Mine Workers this year not to have placed themselves in such a position that a strike seemed to be necessary to preserve the appearance of consistency. When demands were refused and refused in a manner to indicate decision, it would have been well to withdraw them and wait for future developments. Big manufacturing corporations and big mining companies have shown themselves not so vulnerable as had been supposed. Another lesson taught by these two labor controversies, as well as by the building strike in Chicago in 1900, is the assurance that labor organizations will not yet be permitted to control the great business interests of the country. Such organizations have accomplished considerable benefit in various ways, but some developments have been of a character to cause serious apprehension lest such control of industrial affairs be secured as to break down the methods through which this country has developed its natural and mechanical resources and become pre-eminent among the nations of the world. It has been shown in three successive years that the employers of this country have the necessary grit to resist when aggressions are carried too far.

We must confess to some disappointment that the elaborate census report by William G. Gray of the American Iron and Steel Association does not separate the figures for the manufacture of steel from those relating to the production of the rolling mills. We appreciate the difficulties which it would have involved to secure the principal data relating to wages and raw materials. It was particularly on one point that we searched for information because we possess no statistics bearing upon the subject, and that is the quantity of old material consumed by our steel works and rolling mills. Mr. Gray reports that the rolling mills and steel works used in the census year 1900, 4,113,287 gross tons of "old iron or steel rails and other scrap iron and steel," valued at $66,670,855, the consumption of pig iron having been 10,410,281 tons, valued at $151,042,348. These figures furnish an indication of the extent to which iron re-enters the cycle. It would be very interesting to know how much of this enormous tonnage was scrap remelted in the open hearth steel furnaces and in Bessemer converters, and how much of it was rerolled in the mills. The question of the supply of scrap has become a very serious one since the multiplication of basic open hearth steel plants. During the past year the country has been thoroughly scoured, and it is safe to say that for years to come the amount of old material which comes into the market will be comparatively restricted.

The Lalance & Grosjean Mfg. Company of New York are making some important improvements in their rolling mill plant at Harrisburg, Pa., including the installation of motors in place of the smaller steam engines and the erection of three large gas producers and five new annealing furnaces. The entire plant, consisting of a bar mill, three tin mills and one sheet mill, is in active operation.

Patents and the Industrial Arts.

The Census Office has issued a highly interesting bulletin under the title "Patents in Relation to Manufactures," by Story B. Ladd. The principal report is largely statistical, but there is an appendix summarizing developments during the period from 1870 to 1900, from which we select the following:

Metal Working.

Annealing and Tempering.—There have been 860 patents issued in this class. Steel wire is now tempered and annealed by electricity. See patent 211,938, February 4, 1874, to Shaw. It is found that the wire can be heated by the passage of the current more evenly than by combustion, the product being of uniform temper throughout. This process is much used in producing clock and watch springs. The Harvey process, patents 376,194, January 10, 1888, and 460,262, September 29, 1891, for making armor plate by imbedding the face of the plate in carbon, protecting the back and sides with sand, heating to about the melting point of cast iron and subsequently hardening the face, is now in general use.

Making Bolts, Nails, Nuts, Rivets and Screws.—Good illustrations of modern machines for the production of wood screws, bolts, rivets and nuts may be seen in patents to Rogers, July 10, 1888, 386,091; to Passoni, May 21, 1895, 539,590, and to Dunham, June 12, 1894, 521,233. The only marked advance in screw machinery has been in the production of a rolled or swaged thread for wood screws, shown in patents to Rogers, September 20, 1887, 370,354, and August 6, 1889, 408,529. In the making of metal screws a marked advance has been made in rendering machinery rapid in operation and capable of working on a multiplicity of blanks or stock rods, as shown in the patent to Hakewessel & Henn, December 10, 1895, 551,119, but the automatic production of a complete screw is older than this period.

In the art of tack making, patent to Russell, May 25, 1897, 583,420, discloses a machine for automatically making tacks from a coil of wire without waste of material and with great rapidity. Machines for automatically forging horseshoe nails are found in patents to Abbott, July 27, 1897, and to Williams, May 16, 1899, 625,229. An ingenious automatic machine for rapidly threading nuts fed and discharged in a continuous stream is exhibited in patent to Riggs, December 4, 1900, 662,965.

Making Chains, Staples and Horseshoes.—Improvements in this line have been largely in details. Machines for automatically manufacturing chains, both by rolling from solid bar and by twisting and assembling wire links, existed prior to 1871, the only improvements, with one exception, being on lines then existing and exhibited in patents to Klatte, July 24, 1894, 523,432, and Breul, January 19, 1892, 467,331. The exception relates to machines for stamping links from sheet metal and assembling such links and is shown in patent to Egge, April 16, 1878, 202,528.

Automatic machines for cutting, bending and shaping links for drive chains from a continuous strip of metal and assembling them into a completed chain are shown in patents to S. D. Locke, April 13, 1897, 580,579, and to Viellard & Oswald, April 13, 1897, 580,564.

Metal Boring and Drilling.—In this art effort has been directed mainly in two directions—viz., to the development of high speed, friction driven drills of the sensitive type for small work (Stover & Hoefer, July 16, 1895, 542,695), and to multispindle drills capable of being adjusted by telescopic or flexible shafting, as shown in the patent to Zinzen, August 13, 1895, 544,495. Many special tools, particularly those designed for bicycle work, have been devised, as exhibited by Hillman, August 11, 1891, 457,718, but improvements have generally been in the line of greater speed and capacity and in rendering the action automatic, for which attention is called to the patent to Richards, April 29, 1890, 426,571.

Metal Founding.—Patent 629,480, July 25, 1899, Uehling, and patents 583,424, May 25, 1897, and 657,069, 657,070, 657,071, and 657,072, each August 28, 1900, to Acklin and Pattison, relate to continuously operating pig iron casting machines of an endless chain type which receives the metal from a blast furnace, cools it and delivers the pigs to cars. A rotary table type of machine for the same purpose is covered by patents 629,903, August 1, 1899, Hartman, and 620,020, February 11, 1899, Davies. It is understood that these machines have revolutionized the pig casting art in this country and that they have been introduced into England, Germany and Austria.

Barr, in patent 207,794, September 10, 1878, improves on the old method of chilling the rim of a cast wheel by a sectional chill, which, when heated by the molten iron, expands inwardly, maintaining a continuous pressure on the rim of the wheel as the wheel contracts on cooling. This has been further improved by Whitney, patent 10,804, February 1, 1887, reissue, who uses an outer ring, an inner ring composed of a series of sections, and webs connecting the inner section and the outer ring. Giers, patent 283,735, August 21, 1883, takes the ingot from the mold and puts it in a soaking pit to allow the heat within the ingot to radiate outward and reheat the exterior. The ingot is then immediately rolled without reheating.

Patents 648,292, April 24, 1900, Pridmore, and 682,325, May 11, 1897, and 654,292, July 24, 1900, Tabor and Mumford, mark important practical improvements in molding machines which have gone into extensive use.

Metal Tube Manufacture.—In this the improvements since 1871 have been principally in the manufacture of seamless metal tubes. Three processes are worthy of mention: (1) Passing a heated solid rod endwise between the working faces of two rapidly rotating tapered rolls set with their axes at an angle to each other, Mannesmann, April 25, 1887, 361,954; (2) Forcing a tube into a rapidly rotating die, whereby the friction softens the tube and the pressure and rotation of the die spin it into a tube of reduced diameter, Bevington, January 13, 1891, 444,721; (3) placing a hot ingot in a die and forcing a mandrel through the ingot, thereby causing it to assume the shape of the interior of the die and greatly condensing the metal, Robertson, November 26, 1889, 416,014, and Ehrhardt, April 11, 1893, 495,245.

Patents to Stiefel, February 7, 1899, 618,917, and Becker, June 12, 1900, 651,790, show how to modify, for the purpose of avoiding twisting the metal, the rolls invented by Mannesmann.

The manufacture of butt weld iron and steel tubing has been facilitated by the method set forth in patent to Patterson, April 20, 1897, 581,251. W. A. McCool, in a patent dated April 12, 1898, 602,416, disclosed an improvement in the manufacture of drawn tubing by clearing the oxide from the interior and exterior of the blank by means of a blast of chilled shot directed against it instead of by the chemical treatment previously adopted.

A practical machine for making tubing from a cold blank by an electrical welding process is described in patent to Parpart, September 25, 1900, 658,741.

The patent to J. T. Crowden, 633,430, September 19, 1899, illustrates a departure in the manner of assembling pipe sections, the joints between the several sections being formed by hydraulic pressure while supported within a jig or mold.

Metal Turning, Planing and Milling.—The improvements in this art consist essentially in making the machines more automatic in character, thus increasing their speed and capacity. In lathes entire automatic action is secured by the use of a differential screw nut for all purposes, thereby dispensing with rack feed altogether. An example of this is found in the patent to McClellan, February 12, 1895, 533,997. Milling machines are so constructed that the same machine may be used in all kinds of milling work. Such devices are those of Lipe, February 5, 1884, 292,928; Cosgrove, August 7, 1883, 282,704, and Jones, July 25, 1893, 502,257. In cutting gears the blank may be revolved while the teeth are being cut, and at the same time the cutters moved bodily in the direction that the blank is revolved. This is shown in the patent to Swasey, December 29, 1885, 333,488.

Later improvements have been of the so-called tooth generating type, wherein the cutter in operation bears to the blank being cut the relationship of an intermeshing gear. Patents of this type are Fellows, March 30,

1897, 579,708; Warren, August 24, 1897, 588,738; and Beale, December 27, 1898, 616,648.

Improved turret screw machines and lathes designed to increase the output and broaden the range of usefulness of such machines are disclosed in patent to Davenport, May 17, 1898, 604,306, and patent to Conradson, December 26, 1899, 639,888. Patents to Brockie, June 20, 1899, 627,385, and to Hartness, October 31, 1899, 635,887 and 635,888, describe automatic turret lathes controlled by fluid pressure whereby an infinite variety of tool speeds may be obtained and unlimited sensitiveness and delicacy of control.

Planing machines have been improved by causing the cutting tool to move in cycloidal and other curved paths. For examples see Wainwright and Morrison, January 22, 1895, 533,025. In turning car wheels an improvement consists in bringing the wheel to be dressed into close proximity to the edge of a rapidly revolving smooth metal disk, whereby the surface of the wheel is melted away without there being any actual contact between the wheel surface and disk, and is shown in the patent to Miltimore, August 24, 1886, 347,951.

Metal Rolling.—Marked results in methods of rolling heavy steel railroad rails have proceeded from the inventions of Kennedy, patented April 18, 1899, 623,479, and Morrison, patented July 17, 1900, 654,071.

A machine designed to roll sheet metal for tin plate automatically is covered by patent to Norton, March 8, 1898, 600,165. Patent to Donner, December 6, 1898, 615,535, is said to set forth a practical improvement in the manufacture of black plate.

Metal Welding.—Here the chief improvement has been in welding by electricity. This branch has developed entirely since 1881, and there are now four systems in use: (1) Welding by means of a voltaic arc sprung between the work and a carbon pencil electrode, which may be moved so as to concentrate heat at a desired point, De Benardos and Olszewski, May 17, 1887, 363,320. (2) The Thomson method consists in inducing in an electric current of large amperage and low voltage a resistance, as by abutting together the bars to be welded, whereby the heat is concentrated at the point of abutment or weld, Thomson, August 10, 1886, 347,141, and Thomson and Harthan, July 18, 1893, 501,546. (3) The Coffin system is a combination of the arc and Thomson methods in one apparatus, Coffin, April 16, 1889, 401,639; January 7, 1890, 419,032, and January 9, 1894, 512,604. (4) In the water pail system, introduced since 1892, an acidulated bath forms one electrode and the work the other. By introducing the work into a bath a gaseous resistance envelope is formed about the submerged part, which is rapidly raised to a white heat. See Hunter, May 22, 1894, 520,360, and Burton, April 9, 1895, 537,405. In this class 857 patents have been issued.

Brown & McFeaters, in a patent granted April 17, 1900, 647,478, show how to unite the ends of lead pipe by coating with mercury and then applying pressure and slight heat.

Miscellaneous.—Patents 220,768, October 21, 1879, Morewood; 329,240, October 27, 1885, Taylor *et al.*, and 426,962, April 29, 1890, Rogers and Player, describe important machines for automatically coating iron plates with tin, largely dispensing with hand labor.

Patent 539,058, May 14, 1895, Jerome, describes an apparently successful application of aluminum to horseshoes. Fine particles of hardened metal, such as steel, are pressed into the light aluminum body, thus securing the desired lightness with the hardness of the wearing surface essential in a serviceable shoe.

Patent 491,289, February 7, 1893, Manville, shows the mechanism used in forming the hump on the De Long garment hook.

A method of producing thin foil of certain nonmalleable as well as of the malleable metals is covered by patent to Alefeld, March 13, 1900, 645,197.

A machine for making secondary battery plates by spinning up ribs on both sides of a lead plate is disclosed in patent to Madden, December 1, 1896, 572,363.

So-called expanded metal, widely used for building purposes, is rapidly manufactured by a machine patented to Pitkin, February 14, 1899, 619,340.

Patent to Einfeldt, March 27, 1900, 646,269, covers a machine that automatically makes metal vehicle wheels by progressively bending a strip of metal to form the rim and successively fastening the spoke simultaneously to the rim and hub.

Patent 382,321, May 8, 1888, Norton and Hodgson, describes a successful method of producing sheets of lead or solder by pouring molten metal in a continuous unbroken stream between two rollers revolving together with a space between them equal to the thickness of the sheet metal to be produced, and at a sufficiently great surface speed to offer no obstruction to the flowing stream of molten metal.

Sheet Metal Ware Making.—In this art, especially in soldering mechanism, important steps forward have been taken. In patent 243,287, June 21, 1881, Miller applies an endless chain as the means for pushing a series of cans along a waved track, whereby cans are rapidly fluxed and soldered. In 250,096, November 29, 1881, Norton applies to a similar mechanism asbestos wipers to remove the surplus solder from the cans as the side seams are automatically soldered. In 267,014, November 7, 1882, Norton, is well illustrated the advance in machines which automatically apply to can bodies heads fitted outside the same, sizing the body so that it may readily receive the head. 384,825, June 19, 1888, Coleman, covers a machine which solders the head on one end of the already prepared can body, rotating the can so as to get an even application of the solder and wiping off the excess. When an attendant reverses the position of the can the other end is treated in the same manner. 450,624, April 21, 1891, Kendall, shows improvement in a machine in which the bodies are clamped by retaining jaws which register the heads and bodies and retain them in such relation while the heads are forced upon the bodies. In 465,019, December 15, 1891, and 480,256, August 9, 1892, Foote, devices are shown which automatically apply and solder the can heads and bodies while in continuous motion. In patent 495,426, April 11, 1893, Murch and Gray disclose an apparatus whereby they form the complete can body or other tubular structures at a single operation, edging the blank, folding to shape, interlocking and compacting the side seam as the metal is carried forward by an endless chain. Patent to Kendall and Schaake, 489,484, January 10, 1893, affords a fair illustration of one of the more recent and most compact machines for seaming can bodies.

In later years the hermetic sealing of sheet metal cans by vacuum or atmospheric pressure is an important improvement. The patent to Norton, 620,247, February 28, 1899, shows a machine of this type adapted to simultaneously seal a trayfull of cans. The machine comprises a receiver, through which the cans may be inserted or removed, a follower plate for forcing the covers home upon the cans, a valve for opening and closing the exhaust and air inlet communications and means for automatically operating such parts.

The above exhibit some of the steps and progressive types in the advance from hand and foot operated can machines to those power machines which automatically convert a simple blank or plate of sheet metal into the finished can, an advance in the art which has taken place within the period of 30 years.

Wire Working.—In the art of wire working great progress has been made in several types of machines. Power mechanism for barbing fence wire has been originated, advanced to practical perfection, and in recent years the art has lain dormant. Reissued patent 7566, March 20, 1877, Glidden and Vaughan, is the foundation patent of this type. Later machines are but improvements in specific details on this invention. Patent 380,664, April 3, 1888, to Scarles, shows the advanced type of wire netting machines which, though not originated, have been largely improved by minute steps since 1871. Few types of wire working devices have made greater or more important advances than machines for building standing wire fences. From the old line and tie fence making by hand tools, through the initial successful wire and picket fence machine of Fultz, 298,368, May 13, 1884, to the machine of Kitselman, 356,322, January 18, 1887, there is evident advance. In this class 1,861 patents have been issued. Patent 406,450, July 9, 1889, La Casse and Wille, is an important contribution to the bot-

tling art, being for a machine which expeditiously wires the corks in bottles. Patent to Perry, 619,692, February 14, 1899, illustrates an important step in fabric making, the strand and stay wires being electrically welded during the continuous feed of the machine. The patent to Anderson, 654,583, July 31, 1900, shows the advance made in electric coil winding mechanism, wherein the wire is wound into helices, bobbins, &c., and sheets of paper or other insulating material introduced at intervals.

Pig Iron Production Stationary.

The troubles in the fuel supply have had their marked effect on the production of Pig Iron during August. In spite of the fact that the month counted 31 days the output did not quite reach 1,500,000 tons.

The weekly capacity of the furnaces in blast on September 1 compares as follows with that of the preceding periods:

	Total capacity per week. Gross tons.	Coke capacity per week.	Charcoal capacity per week.
September 1, 1902	335,189	328,243	6,946
August 1	336,465	328,745	7,720
July 1	350,890	343,250	7,640
June 1	344,748	337,492	7,256
May 1	352,064	337,627	6,437
April 1	337,424	331,140	6,284
March 1	323,028	316,039	6,989
February 1	332,045	325,440	6,605
January 1	298,460	291,992	6,468
December 1, 1901	324,761	317,358	7,403
November 1	320,824	313,775	7,049
October 1	307,982	300,538	7,444
September 1	299,861	293,256	6,605
August 1	303,847	297,269	6,578
July 1	310,950	303,793	7,157
June 1	314,505	306,991	7,514
May 1	301,125	293,915	7,210
April 1	296,676	288,766	7,910
March 1	292,899	284,825	8,074
February 1	278,258	278,258	8,335
January 1	250,351	243,254	7,097
December 1, 1900	228,846	222,067	6,779
November 1	215,304	207,381	7,923
October 1	223,169	214,921	8,248
September 1	231,778	223,551	8,227
August 1	244,426	236,131	8,295
July 1	283,413	274,921	8,492
June 1	296,376	288,771	7,605
May 1	293,850	286,956	6,894
April 1	289,482	281,644	7,838
March 1	292,643	285,596	7,047

The difficulties of closely estimating the capacity of the active blast furnaces are very much enhanced under the conditions prevailing. Furnaces banked are not technically out, yet they may be in that condition for weeks and months and to all practical purposes are not producers. We have rated the capacity on the basis of recent performances rather than upon normal product. When that is again attained the furnaces in operation should attain a monthly output of 1,600,000 tons.

Production of Pig Iron—Gross Tons.

	First six months, 1902.	July, 1902.	August, 1902.
New York	169,890	32,816	34,450
New Jersey	105,295	12,880	15,032
Schuylkill Valley	239,493	45,329	39,208
Lehigh Valley	282,276	38,972	38,980
Susquehanna and Lebanon	321,495	49,362	47,332
Pittsburgh district	2,094,274	356,777	355,524
Shenango Valley	606,478	101,823	104,903
Western Pennsylvania	497,431	90,618	88,843
Maryland, Virginia and Kentucky	461,215	75,770	75,499
Wheeling District	359,136	69,649	74,436
Central and Northern Ohio	556,761	105,463	114,108
Mahoning Valley	764,571	116,175	112,502
Hanging Rock and Hocking Valley	183,239	23,677	27,185
Illinois, Wisconsin, Minnesota, Missouri and Colorado	1,114,793	200,599	190,989
Alabama	677,199	90,562	120,370
Tennessee	186,067	31,386	29,004
	8,619,613	1,441,858	1,468,165
Charcoal pig	186,098	34,038	30,677
Totals	8,805,711	1,475,896	1,498,842

The status of the anthracite and coke furnaces was as follows on September 1:

Coke and Anthracite Furnaces in Blast.

	September 1.			August 1.	
Location of furnaces.	Number of stacks.	Number in blast.	Capacity per week.	Number in blast.	Capacity per week.
New York	14	8	7,780	8	8,017
New Jersey	6	3	2,917	3	3,450
Spiegel	3	0	0	2	215
Pennsylvania:					
Lehigh Valley	28	15	8,802	17	9,650
Spiegel	1	0	0	1	93
Schuylkill Valley	14	8	8,719	11	10,014
Low. Susquehanna	10	7	5,915	7	5,837
Lebanon Valley	12	7	4,918	7	4,939
Pittsburgh Dist	34	32	80,280	29	78,495
Spiegel	0	0	0	2	2,067
Shenango Valley	19	17	24,893	16	23,835
Western Penn	21	18	20,182	17	20,230
Maryland	5	4	5,832	3	5,112
Wheeling Dist	11	10	16,808	10	15,727
Ohio:					
Mahoning Valley	15	11	21,420	14	23,729
Cent. and North	14	13	25,766	13	23,265
Hocking Valley	3	2	632	2	655
Hanging Rock	11	9	5,183	9	5,143
Illinois	19	16	33,156	16	29,955
Spiegel	1	1	918	1	880
Minnesota	1	1	1,400	0	0
Wisconsin	5	4	4,181	5	5,125
Missouri	1	1	723	1	1,036
Colorado	3	2	3,171	3	4,500
The South:					
Virginia	23	14	9,174	15	10,482
Kentucky	7	6	2,042	6	2,513
Alabama	40	30	26,876	31	27,740
Tennessee	16	13	6,555	12	6,041
Totals	336	272	328,243	261	328,745

During August there were blown out Topton in the Schuylkill Valley, one Lehigh Iron & Steel in the Lehigh Valley, Northside in the Shenango Valley, North Cornwall in the Lebanon Valley, Mayville in Wisconsin, one Hubbard and Haselton in the Mahoning Valley and one Sheffield in Alabama. There were banked on September 1 one Wharton in New Jersey, Henry Clay in the Schuylkill Valley and Anna in the Mahoning Valley, in addition to those which were in the same condition on August 1. Work was resumed by Pequest in New Jersey, the Sharon steel furnace in the Shenango Valley, Colonial in Western Pennsylvania, Zenith in Minnesota and Citico in Tennessee.

The status of the charcoal furnaces was as follows:

Charcoal Furnaces in Blast.

	Total number of	September 1. No. in	Capacity per	August 1. No. in	Capacity per
Location of furnaces.	stacks.	blast.	week.	blast.	week.
New England	7	3	226	3	240
New York	3	2	586	3	729
Pennsylvania	5	3	152	3	144
Maryland	1	0	0	0	0
Virginia	3	2	96	2	97
Ohio	8	5	381	7	428
Kentucky	3	0	0	0	0
Tennessee	1	0	0	0	0
Georgia	4	3	988	2	737
Alabama	4	3	1,181	3	1,143
Michigan, Missouri and Wisconsin	10	6	3,086	8	4,102
Washington	1	1	100	1	100
Texas	4	1	150	0	0
Totals	54	29	6,946	32	7,720

During August there were the following changes: Old Alcalde in Texas and Tallapoosa in Georgia were blown in, and Elk Rapids and Manistique in Michigan were blown out.

Furnace Stocks.

The position of furnace stocks, sold and unsold, as reported to us, was as below on September 1, as compared with the five preceding months, the same furnaces being represented as in former months. This does not include the holdings of the steel works producing their own iron:

Stocks.	Apr. 1.	May 1.	June 1.	July 1.	Aug. 1.	Sept. 1.
Anthracite and Coke	69,974	63,583	57,231	61,312	64,059	63,666
Charcoal	23,289	20,276	15,977	13,725	13,071	15,873
Totals	93,263	83,859	73,208	75,037	77,130	79,539

The new bar mills at the plant of the Parkersburg Iron & Steel Company, Parkersburg, W. Va., have been

put in full operation and are working very satisfactorily. This concern are operating six sheet mills, but on three of them black plate for tinning can be rolled if necessary.

The Fastest Vessel Afloat.

Charles R. Flint's yacht, the "Arrow," proved herself the fastest boat afloat, far surpassing the best American record and exceeding by two miles an hour the world's record, held by the British torpedo boat destroyer "Viper," of 43 miles an hour. In a speed test on the Hudson on the 6th inst. she made a knot in 1 minute 32 seconds, equivalent to a statute mile in 1 minute 19 89-100 seconds. This rate of 39 13-100 knots, or 45 6-100 statute miles, an hour, so far exceeds the best time ever made under similar conditions that it will be taken by yachtsmen as marking a new era in the construction of such craft. During the test the "Arrow" carried 400 pounds of steam in her boilers and 375 pounds in the engines. Besides the captain and chief engineer, she carried a crew of two assistant engineers, two firemen, one water tender, two oilers and three deck hands. Her extreme length is 130 feet 4 inches; length on the water line, 130 feet; extreme beam, 12 feet 6 inches, and draft under screws, 4 feet 11 inches. She has two quadruple expansion engines, capable of developing 4000 horse-power.

Another Steamship Line to the Orient.

The inauguration of a third steam service from New York to Chinese, Philippine and Japanese ports by the newly formed American-Asiatic Steamship Company is expected in shipping circles to prove a decided stimulus to the Far Eastern trade of the United States. It is the intention of the company to build six of the largest and most improved cargo vessels as soon as their business has been established. The contracts for the building of these vessels will, it is said, be let in this country within two years. The "Gibraltar," with which the service will be inaugurated, was built on the Clyde, and is now afloat for Philadelphia, where she will discharge and immediately clear for New York. Her net tonnage is 8600 tons.

The American-Asiatic Steamship Company were incorporated in Maine. The officers are: President, William Barclay Parsons; vice-president, D. Leroy Dresser; secretary and treasurer, T. Ashley Sparks. The directors are, besides the officers named, August Belmont, C. A. Tomes, Cornelius Vanderbilt and John D. Gluck. The last named is to be manager of the line. Luther Kountze of Kountze Bros., Vermilye & Co. and John Crosby Brown of Brown Bros. & Co. are also important stockholders.

Milling vs. Planing.

In the course of a discussion on a paper on "Modern Machine Methods," at a meeting of the British Institution of Mechanical Engineers, J. H. Wicksteed exhibited a double cutting tool box for a planing machine, the device being "of novel construction, with special arrangement for holding the tool steady, yet allowing it to swing clear on the return stroke, while the overrun would not be more than 6 inches."

The report of the discussion, which we extract from *Engineering*, states that "armor plates had been planed with machines having two cross slides, each carrying 11 tools, so that there would be as many cutting edges as with a milling machine. The same device was largely used in planing frames of locomotives. Thousands of tons of plates were being planed on their edges every week with double cutting tools. The plates came from the makers sheared, sometimes with a good ½ inch to be taken off. Plate edge planing was carried on on a large scale. Sometimes the plates were bolted together and the edges milled; but many who had tried the plan had gone back to planing. It took more time to adjust six plates in a group than six single plates, and so it had been decided as preferable to plane one plate at a time."

Daniel Adamson, commenting upon this, stated that "one objection to milling the edges of boiler plates was that they often have beveled edges."

MANUFACTURING.

Iron and Steel.

The blast furnace at Cedar Point, N. Y., has been banked on account of an explosion.

The new tube mill of the Wheeling Steel & Iron Company, at Benwood, W. Va., has been started up. This plant is equipped to make tubes up to 8 inches in diameter. The skelp for the tube mill will be rolled by the company in their own skelp mills.

The old Alcalde Furnace, Rusk, Texas, was blown in August 21 last.

The Northside Furnace, at Sharpsville, Pa., was blown out August 31 for the purpose of making alterations on top of furnace.

The Central Iron & Steel Company of Harrisburg, Pa., expect to blow in their Paxton Furnace the current week. The capacity has been increased from 60 to 175 tons per day.

The Tallapoosa Furnace, Tallapoosa, Ga., was blown in September 1.

The tin house departments of the Shenango and New Castle works of the American Tin Plate Company, at New Castle, Pa., are still in operation, but as soon as all the black plate is worked up they will be shut down for an indefinite period.

The Peru Steel Casting Company, Peru, Ind., have not room enough in their present quarters, and will build an addition of 64 feet to the east end of the casting house, to which an addition of 128 feet was recently added. Another building 128 feet in length has just been finished north of the casting house and is now in use.

At a meeting of the stockholders of the Clearfield Iron & Steel Company of Pittsburgh, held last week, the capital stock was increased to $500,000. The concern are building a plant at Clearfield, Pa., for the manufacture of muck bar, merchant iron bars and other products.

Isabella furnace No. 3, American Steel Hoop Company, Etna, near Pittsburgh, which has been rebuilt and enlarged to 20 x 90 feet, was blown in last week. Nos. 1 and 2 have also been rebuilt and these three stacks will now have a daily output of very close to 300 tons each.

The Coxey Steel Company of Mt. Vernon, Ohio, and the Coxey Silica Sand Company of Massillon, both owned by J. S. Coxey, of Commonweal Army fame, have been placed in the hands of a receiver on the application of the Fourth National Bank of Cadiz on a judgment of $5041.60. James Israel, secretary-treasurer of the Mt. Vernon, was appointed receiver of both properties. General Coxey has expended nearly $300,000 on the steel plant at Mt. Vernon, and has never been able to complete it.

The Donovan Wire & Iron Company of Toledo have placed contracts for the erection of their new plant. There will be four buildings—the machine shop, 60 x 200; foundry, 60 x 180; pattern shop, 40 x 80, and office, 40 x 40. The company will buy a large amount of new machinery for the production of structural iron work.

Soho furnace of the Jones & Laughlins Steel Company, at Pittsburgh, which has been idle for several months, undergoing repairs and improvements, will be started this month. An automatic skip hoist has been erected to take the place of the elevator arrangement for charging the furnace. Other important improvements have been made and the furnace is expected to turn out from 350 to 400 tons of iron per day.

We are advised by George S. Griscom, Jr., Murtland Building, Pittsburgh, resident agent for J. K. Dimmick & Co. of Philadelphia, that the Dimmick interests, which embraced J. K. Dimmick & Co. and the Dimmick Pipe Company of Birmingham, Ala., have acquired the Williamson furnace of the Williamson Iron Company, at Birmingham, Ala., and also the foundry and machine shops of that concern at that place. The blast furnace is now idle, but will be repaired and improved and put in operation as soon as possible.

A special meeting of the stockholders of the Harbison Walker Refractories Company will be held in Pittsburgh in the near future to take action on a proposed increase in the capital stock from $25,350,000 to $27,600,000.

General Machinery.

The Youngstown Engineering Company, Youngstown, Ohio, manufacturers of electric traveling cranes, general foundry and machine work, have received an order from the General Electric Company for a 30-ton electric traveling crane with an auxiliary hoist. They have also received an order from the Carnegie Steel Company, to be installed at their Carrie Furnaces, at Rankin, an electric traveling crane of 40 tons capacity, with a 15-ton auxiliary hoist and a span of 60 feet.

The Fischer Foundry & Machine Company, South Side, Pittsburgh, builders of rolling mill, glass works and general machinery, have received a contract for all the machinery for the new

tube mill now building by the Susquehanna Iron & Steel Company, at Columbia, Pa., excepting the threading and tapping machines. The machinery will be made new from patterns and drawings and will contain some radically new features, as it is intended to make this one of the most efficient tube plants, in point of economy and operation, in the country. The Fischer Foundry & Machine Company have also many other large orders on hand and are running their shops to utmost capacity.

The Northern Engineering Works, Detroit, Mich., have the contract for supplying the electric cranes for the new foundry of the American Shipbuilding Company of Detroit, Mich. The contract consists of one 40-ton five-motor and one 15-ton three-motor electric traveling crane; one 3-ton electric crane and three 5-ton cranes.

The Pittsburgh Switch & Signal Company of Pittsburgh have been chartered with a capital of $250,000. They will build a plant in Pittsburgh for the manufacture of safety signals. The incorporators are Lynda F. Miller, J. Albert Odell and William E. Jacobs of Pittsburgh.

A new company, known as the Anderson Bridge & Scraper Company, have been organized to take over the plant and business of the Northwestern Scraper Company of Anderson, Ind. The specialties of manufacture will be steel arches, steel culverts, steel bridges, road machines, wheeled and drag scrapers, plows, blades for all road graders. The officers of the new concern are D. F. Mustard, president; A. J. Applegate, vice-president; G. E. Nichol, treasurer; E. B. Pierse, secretary.

The Chicago Pneumatic Tool Company report that their air compressor plant, at Franklin, Pa., is operating day and night. Among recent sales of importance are two large compound compressors for the New York Central & Hudson River Railroad Company's Jersey Shore shops; two large compressors for the Readville shops of the New York, New Haven & Hartford Railroad Company; a compound compressor of 2000 cubic feet capacity per minute for the Lake Shore & Michigan Southern's Collinwood shops, being a duplicate of the first compressor installed; a 1000-foot compound compressor for the St. Louis, Iron Mountain & Southern Railroad, and one of the same capacity for the new shops of the C., C., C. & St. L. (Big Four Railway). They have also secured the Government's order for the installation of a 1000-foot compound compressor at the Norfolk Navy Yard. Other sales include five large size straight line compressors to the American Lime & Stone Company, Tyrone, Pa.; a 1000-foot compound compressor to the Mobile & Ohio Railroad for their shops at Mobile, Ala., and one of 500 cubic feet capacity to the Louisville & Nashville Railroad.

Machinery is now being installed in the new buildings which are being erected at Aurora, Ill., by the American Wood Working Machinery Company.

The Chilton Special Machine Company, 29 East Tenth street, New York, were recently organized with a capital of $100,000 for the purpose of producing button sewing machines. For the present the machines will be built by another concern under contract. The officers of the company are Wm. J. Brandt, president and treasurer; Wm. W. Chilton, vice-president; F. H. Chilton, secretary.

The Pittsburgh Gage & Supply Company, Pittsburgh, have just received an important order for power transmitting machinery outfit from the Maryland Paper Company, and a rope transmission order from the State Institution for Feeble Minded, Polk, Pa.

Under the style of the Enterprise Machine Works, William E. Piper has organized a company at Durand, Mich., for building and repairing all classes of machinery. The business also embodies the making of machines, drawings and models, the development of inventors' ideas and automobile and motor cycle work. E. W. Piper is associated as draftsman.

W. J. Wilgus, chief engineer of the New York Central & Hudson River Railroad Company, Grand Central Station, New York, informs us that during the past two years they have been doing a large amount of work at West Albany, N. Y., and have recently completed two 30-stall engine houses with modern attachments, and now have under way a large new paint shop adjacent to the old buildings and a modern erecting shop on the site of one of the old buildings. The erection of an electric plant is also under advisement.

There is a report at Sharon that the Allis-Chalmers plant at Buffalo, N. Y., will shortly be removed to Sharon, Pa. The Buffalo plant has been principally engaged in the manufacture of flouring machinery.

The Buckeye Engine Company, Salem, Ohio, manufacturers of Buckeye automatic cut-off engines, recently made a shipment of a large engine to Kyoto, Japan. The Buckeye Engine Company have recently closed contracts for a large number of engines, among which are the following: National Mining Company, Pittsburgh, Pa., two 300 horse-power, direct connected; Standard Steel Car Company, Butler, Pa., three 600 horse-power, direct connected, cross; Naugatuck Malleable Iron Company, Union City, Conn., one 225 horse-power, one 100 horse-power, simples; Alan Wood, Iron & Steel Company, Conshohocken, Pa., two 500 horse-power, direct connected, tandems; American Rolling Mill Company, Middletown, Ohio, one 250 horse-power, simple; Wickwire Bros., Cortland, N. Y., one 350 horse-power, direct connected, tandem; Republic Iron & Steel Company, Youngstown, Ohio, two 1000 horse-power, tandems; Republic Iron & Steel Company, Moline, Ill., one 1000 horse-power, tandem; Ohio & Pennsylvania Coal Company, Bergholtz, Ohio, one 350 horse-power, simple; Sharon Steel Hoop Company, Sharon, Pa., one 1400 horse-power, cross; Morden Frog & Crossing Company, Chicago, one 300 horse-power, direct connected, tandem; Penberthy Injector Company, Detroit, Mich., one 175 horse-power direct connected, tandem; Pittsburgh Reduction Company, Pittsburgh, Pa., two 300 horse-power, direct conected, cross; South Chicago Furnace Company, Chicago, Ill., two 450 horse-power, direct connected, tandems; Pioneer Mining & Mfg. Company, Birmingham, Ala., one 300 horse-power, direct connected, cross; Tennessee Coal, Iron & Railroad Company, Ensley, Ala., two 600 horse-power, direct connected, simples; Fairmont Coal Company, Fairmont, W. Va., one 300 horse-power, direct connected, simple; Lackawanna Steel Company, Lebanon, Pa., one 300 horse-power, direct connected, simple.

The Standard Motive Power Company of New York City have closed a contract with the Dover Land & Improvement Company of Canal Dover, Ohio, whereby the former will locate their new shops in that city. The concern will manufacture locomotives, street car motors and automobiles.

The Baker Steel Car Forge Company of Pittsburgh will considerably enlarge their plant at Ellwood City, Pa. Two buildings, one 80 x 120 feet and one 60 x 112 feet, are to be added.

The Youngstown Engineering Company of Youngstown, Ohio, have received an order for a 40-ton electric traveling crane of 60-foot span and containing a 15-ton auxiliary hoist, to be installed at the Carrie furnace department of the Carnegie Steel Company.

Despite the fact that they erected a large addition last year the Cleveland Twist Drill Company of Cleveland find themselves cramped for space and have broken ground for another addition, to be 38 x 127 feet and three stories high, of steel and brick. The building will be used as an extension of the machine shop and considerable new machinery will be installed.

Boilers, Engines, &c.

The Steam & Electrical Equipment Company, Conestoga Building, Pittsburgh, sold last week to the Poughkeepsie Light, Heat & Power Company, of Poughkeepsie, New York, one 190-kw. Stanley, 60-cycle two-phase 2200-volt alternator, and to the Waynesburg Electric Light, Heat & Power Company one Babcock & Wilcox 108 horse-power steam boiler. They report business very good and have a large number of inquiries on their books for steam and electrical equipment of various kinds.

The New Castle Engineering Works have an addition to their boiler shop well advanced toward completion.

An important contract has been awarded to the Bullock Mfg. Company of Cincinnati, Ohio, which will total considerably more than $100,000. It is to supply all the electrical machinery required by both the battle ship "New Jersey" and the cruiser "Des Moines," both of which are now in process of building. This contract includes everything of an electrical nature on both ships, and is valuable to the firm not only because of the amount of money involved, but because it was won in the severest competition with other large manufacturers of electrical appliances.

The Stanley Rule & Level Company of New Britain, Conn., are about to adopt electric driving throughout their works. They have recently purchased from the Westinghouse Electric & Mfg. Company a 375-kw., 500-volt, direct current engine type generator, to be operated in connection with a marine type engine, running at 200 revolutions per minute, furnished by Westinghouse, Church, Kerr & Co.

The United Steel Company, Canton, Ohio, have placed an order for four 250 horse-power water tube boilers with the Pittsburgh Gage & Supply Company, Pittsburgh.

The Toledo Heating & Lighting Company, Toledo, Ohio, are making extensive additions to their power station and are installing a large generator, a 400 horse-power Ball & Wood cross compound condensing engine and Green Engineering Company's chain grate stokers. A 150-foot stack is to be erected.

The water works trustees of Mansfield, Ohio, have commenced improvements contemplated by a recent $15,000 bond issue. Orders have been placed for five 200 horse-power boilers to be built by the Aultman-Taylor Machinery Company, for a large air compressor and for feed water heaters.

The Mansfield Engineering Company, Mansfield, Ohio, have completed plans for a power house to be erected at a new sanitarium at Marion.

Foundries.

At the recent annual meeting of the Hartford Foundry Corporation, Hartford, Conn., the following officers were elected: Albert Horton of Providence, B. J. Horton of Providence, James B. Moore, Theodore M. Lincoln, John W. Conway, Ernest H. Cady and James G. Buckley, directors; Theodore M. Lincoln, president; J. W. Conway, vice-president and superintendent; E. H. Cady, secretary and treasurer; J. G. Buckley, assistant secretary.

An addition, 80 x 122 feet, is being built to the plant of the Marion Glex Iron Foundry, Marion, Ind. A 30-ton cupola and a rotary pressure blower are to be added.

On Friday, August 29, the foundry of the great new Allis-Chalmers plant at West Allis, Wis., was placed in operation. Officials of the company were present and the first iron run off was cast into souvenir paper weights.

The Frazer & Jones Company, manufacturers of harness hardware, leather goods and malleable iron castings, Syracuse, N. Y., have purchased a piece of property adjoining their foundry, and the erection of a new one-story building for foundry purposes is now in progress. This building will cover the entire frontage of the property acquired. They are also carrying up their old foundry building one floor, making a two-story building, which will also be used entirely for foundry purposes.

Contracts have just been awarded for a new foundry to be added to the works of the Riverside Boiler Works, Ridgefield Park, N. J. The building is to be 34 x 84 feet, with two wings for cupolas. The order for the mechanical equipment has been awarded to J. Gilmon, New York.

Equipment has just been purchased by the Racine Steel & Iron Mfg. Company of Racine, Wis. The company have extended their works which have grown very rapidly in the production of cast and steel wagon skeins. The capital stock of the company has been increased from $75,000 to $125,000. The new officers are J. G. Johnson, president; C. W. Hawes, vice-president, and G. N. Prentiss, secretary and general manager.

The Zanesville Malleable Iron Company, Zanesville, Ohio, are about to place in operation their new plant. The new buildings are 120 x 280 feet, 120 x 200 feet, 40 x 80 feet and 40 x 60 feet. They will produce malleable castings and will employ about 120 molders. R. H. Free is president and S. H. England secretary of the company.

Fires.

Fire destroyed the mills and factory of A. McKillop & Sons, West Lorpe, Ont., including new machinery. The loss is estimated at $25,000.

The plant of the Huntington Stove & Foundry Company, Huntington, W. Va., was burned, entailing a loss of $50,000.

The concentrator of the Montana Ore Purchasing Company, Butte, Mont., was totally destroyed by fire. The loss is estimated at $100,000, which is covered by $60,000 insurance.

The plant of the Hartford Foundry Company, Hartford, Conn., was seriously damaged by fire last week. The officers of the company hope to have 60 per cent. of the plant in operation again within two weeks.

The Portland Iron Company's works, located at Tigonia, Maine, was burned to the ground on Wednesday, August 27.

A fire destroyed the riveting tower of the boiler works of Edward Kendall & Sons, Cambridgeport, Mass. The damage amounted to several thousand dollars, fully covered by insurance. The tower was 65 feet in hight, and about 30 feet square, and built of wood. In it, besides the furnace and riveting machines, was a 30-ton traveling crane.

The plant of the Ohio Machine Tool Company, Kenton, Ohio, was totally destroyed by fire on September 4, entailing a loss estimated at $100,000.

The plant of the Summit City Mfg. Company of Akron, Ohio, was damaged by fire last week to the extent of $4000. A considerable quantity of finished product and tools was destroyed. Work will be resumed as soon as the damaged buildings can be repaired.

Hardware.

The Draper & Maynard Company, Plymouth, N. H., manufacturers of sporting goods, are building a wing to their factory, 40 x 64 feet, three stories high. They have also just begun using about the same space in a building opposite their plant. The company advise us that the demand for their D. & M. products is such that they could now use these additions to their facilities if they were ready. They are now manufacturing football clothing and intend to manufacture a line of baseball clothing for next season. John F. Maynard, president of the company, who is visiting the trade, is now on the Pacific Coast, and reports meeting with a good measure of success.

United States Clothes Pin Company, Montpelier, Vt., manufacturers of spring clothes pins, which clasp the clothes on the line and hold them until unlocked, advise us that notwithstanding increased facilities they are at present unable to keep up with orders. They refer particularly to their export business, which is steadily increasing.

The Chattanooga Washing Machine & Mfg. Company, Chattanooga, Tenn., incorporated under the State laws of Tennessee, is a consolidation of the interests of the Chattanooga Washing & Wringer Machine Company and the Southern Single Tree Company. The capital stock is $28,000. The officers are: J. W. Cavander, president; Charles Heron, vice-president, and J. A. Willard, treasurer and general manager. The lines of manufacture are washing machines, clothes wringers, curtain poles and patent single trees.

On the 25th ult. the Champion Tool Company, manufacturers of the Champion farriers' tools, &c., Conneaut Lake, Pa., shipped to King Edward Place, Wanborough, Swindon, England, a lot of tools to be used by the farriers of King Edward at his racing stables and on the different tracks where his steeds appear. Although the company's goods are on sale throughout this country and they enjoy a foreign trade, this is their first order of a royal source, and they are, of course, somewhat elated over the achievement.

The Richmond Cedar Works, Richmond, Va., have recently put in an additional boiler of 350 horse-power. Within a year they have installed a system of automatic water sprinklers, which with their volunteer fire department, made up of their own workmen, equip them to fight any fire dangers that may arise. They are placing a new rotary washing machine on the market, under the name of the Majestic, for which large demand is expected.

Southern Plow Company, Columbus, Ga., advise us that their plow department is now in full and complete operation, turning out daily large quantities of steel plow shapes, wood and steel beam steel plows, single and double stocks, double shovels, cultivators, cotton planters, cane mills, syrup kettles, and all kinds of cast plows and extras. The increased size of their plant, together with the economic arrangement of new and improved machinery, enables the company to turn out a much larger volume than ever before, and they are now prepared to supply their customers promptly with a line of goods, the quality, workmanship and finish of which are referred to. They manufacture every part of the different implements shown in their catalogue, with the exception of bolts and malleables. They state that they have their own foundry, machine shops and handle and beam factory all in full operation and are not therefore dependent on outside sources for their wood work and castings.

Preparations are being made by the Cambria Foundry & Machine Company, Johnstown, Pa., for the erection of a large new plant. In view of this the capital stock has been increased from $50,000 to $150,000 and a great deal of the stock has already been subscribed for. The company have not yet selected the site for their new plant, although four or five are under consideration. The work will be commenced as soon as a site has been selected. When the new plant of the company is completed it will have a capacity four times that of the one now in operation in Davis street. This plant has a capacity of 50 dozen shovels a day, while the new one will turn out 200 dozen. At the present time the company are making solid back shovels only, but in the new plant they will also make hollow back, for which they have many inquiries.

Miscellaneous.

The municipality of Anadarko, Okla., has an appropriation of $90,000 for water works, electric lights and school houses. A sum not to exceed $40,000 is to be spent at once for water works. W. H. Edwards is Mayor.

The Rimmon Mfg. Company of Seymour, Conn., are to add a three-story building, 38 x 60 feet, to their works. They will also extend their machine shop somewhat. They manufacture brass and other metal goods, eyelets for shoes, corsets, &c. G. E. Matthews is president of the company, and C. W. Michaels will act as secretary and treasurer.

The Asbestos Mfg. & Supply Company, St. Louis, have rented a factory to be added to their works. The company make steam pipe and boiler coverings.

The Berlin Mills Company of Portland, Maine, lumber and paper manufacturers, have purchased an immense wood pulp timber tract at Mount Washington, N. H. It is proposed to erect a new plant at Gorham, N. H.

The Garland Chain Company are pushing work at the new town which they are laying out near the southern limits of New Castle. The name of the town will be West Pittsburgh, and a large rivet and nut works, which will be one of its industries, will be erected by the Garland Chain Company.

The University of Illinois has installed a 440-volt plant for the lighting of the five new buildings at Champaign, Ill. Two-phase alternating current will be used and each phase will be treated as a single-phase circuit operated on the three-wire system, the neutral wire being supplied with current from an auto-transformer. The generating station contains two-belted, two-phase generators, one of 50 kw. and one of 75 kw., operated at 440 volts, to which will shortly be added an engine type, revolving field, 120-kw. alternator, purchased from the Westinghouse Electric & Mfg. Company.

The Ohio Steel Wheelbarrow Company, Toledo, Ohio, are negotiating for the purchase of a considerable lot of machinery, which they will install in their new plant for the manufacture of steel dump wheelbarrows of a new design.

The Niles Car & Mfg. Company of Niles, Ohio, who have recently completed a plant for the manufacture of steam and interurban cars, have increased their capital stock from $200,000 to $300,000 and will increase their facilities. Dr. J. A. Leitch and George D. Kirkman have been added to the Board of Directors.

The Iron and Metal Trades.

Our monthly report of the Pig Iron industry shows that the production in August was close to 1,500,000 tons, which is rather low for a month of 31 days, and which would have been considerably exceeded had it not been for the short fuel supply. In fact it seems quite safe to predict a monthly production of close to 1,600,000 tons when once again Coke and Anthracite are regularly supplied.

The seaboard has now settled down to a regular supply of foreign Foundry Iron. An interesting transaction bearing on the supply for some time to come is the purchase by Rogers, Brown & Co. of this city of the total Foundry Iron output of the Dominion Iron & Steel Company of Sydney for six months. This, it is estimated, will amount to about 7000 tons per month. It does not, of course, include the whole product of the Canadian company, since a part of the Pig Iron made feeds the open hearth furnaces of the company.

Reports originating abroad speak of large further purchases of Pig Iron for American account, but they cannot be traced here. It is a fact, however, that large interests in the Central West are considering the feasibility of importing a heavy tonnage of Bessemer Pig, the Pittsburgh dispatches speaking of 100,000 tons and upward. It appears that figures have already been submitted.

Our Chicago correspondent reports the sale of a block of 35,000 tons of German Steel Rails to the Gould lines for early delivery at Galveston, Texas. The crowded condition of the domestic mills makes such a transaction possible. Some indication of the differences in the prices named by European mills is furnished by the reported bids on the 50,000-ton Canadian Pacific order. It seems that the lowest German bid was close to $24.25, while the lowest English tender was about $26.40.

In the Steel market similar differences among foreign sellers seem to prevail. Some considerable business has been put through in Billets and Sheet Bars at prices which control the tidewater markets and are considerably lower than domestic material in the Central West. The offerings of domestic material, however, are becoming somewhat freer.

Reports in all the heavy lines continue exceedingly favorable, and there seems to be a little new life even in the coast shipbuilding trade. The tonnage in Structural Material, Plates, &c., is very heavy and shipments are not gaining notably on new orders. The leading interest has orders for a full year's work on Structural Material.

The Wire trade is beginning to show such signs of improvement as to encourage the belief that the slack in this line will be fully taken up when the fall demand attains its full vigor. The Western movement is hampered to some extent by the uncertainty of freight rates, in which considerable cutting is going on, but this will not last long. The Eastern demand has already overtaken the record made last year and is handsomely surpassing it.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one month and one year previous.

	Sep. 10, 1902.	Sep. 3, 1902.	Aug. 13, 1902.	Sep. 11, 1901.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$22.00	*$22.00	*$22.00	$14.75
Foundry Pig No. 2, Southern, Cincinnati	***21.75**	*21.25	*20.25	13.00
Foundry Pig No. 2, Local Chicago	***23.00**	*23.00	*22.00	15.00
Bessemer Pig, Pittsburgh	***21.75**	*21.75	*21.50	15.75
Gray Forge, Pittsburgh	***21.25**	*20.50	20.50	13.50
Lake Superior Charcoal, Chicago	*26.00	*26.00	*26.00	17.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	†*29.00*	31.00	31.25	24.50
Steel Billets, Philadelphia	†*27.00*	†27.50	28.75	27.00
Steel Billets, Chicago	†*30.50*	†29.50	31.00	....
Wire Rods, Pittsburgh	36.00	36.00	36.00	36.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	18.50	18.50	18.50	13.00
O. Steel Rails, Philadelphia	**21.50**	21.50	21.00	16.50
O. Iron Rails, Chicago	**25.00**	24.50	24.50	20.50
O. Iron Rails, Philadelphia	24.00	24.00	24.00	18.50
O. Car Wheels, Chicago	21.00	21.00	21.00	16.00
O. Car Wheels, Philadelphia	20.00	20.00	20.00	16.50
Heavy Steel Scrap, Chicago	18.50	18.00	18.50	12.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.92	1.92	1.95	1.62½
Common Iron Bars, Chicago	**1.90**	1.80	1.80	1.60
Common Iron Bars, Pittsburgh	1.80	1.80	1.80	1.50
Steel Bars, Tidewater	2.00	2.00	2.00	1.60
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater	2.00	2.00	2.00	1.75
Tank Plates, Pittsburgh	1.75	1.75	1.75	1.60
Beams, Tidewater	Nom.	2.10	2.35	1.75
Beams, Pittsburgh	Nom.	2.00	2.00	1.60
Angles, Tidewater	Nom.	2.10	2.35	1.75
Angles, Pittsburgh	Nom.	2.00	2.00	1.60
Skelp, Grooved Iron, Pittsburgh	2.10	2.10	2.10	2.00
Skelp, Sheared Iron, Pittsburgh	2.15	...	2.15	2.05
Sheets, No. 27, Pittsburgh	*2.85*	2.90	2.90	3.75
Barb Wire, f.o.b. Pittsburgh	2.90	2.90	2.90	2.90
Wire Nails, f.o.b. Pittsburgh	2.05	2.05	205	2.30
Cut Nails, Mill	2.05	2.05	2.05	2.05
METALS:				
Copper, New York	**11.80**	11.30	11.60	16.50
Spelter, St. Louis	*5.15*	5.25	5.20	3.87½
Lead, New York	4.10	4.10	4.10	4.37½
Lead, St. Louis	3.97½	3.97½	3.97½	4.25
Tin, New York	*27.00*	27.05	27.87½	24.75
Antimony, Hallett, New York	8.00	8.00	8.00	8.50
Nickel, New York	40.00	40.00	40.00	60.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York	4.19	4.19	4.19	Nom.

* For 1903. † Foreign.

Chicago.

FISHER BUILDING, September 10, 1902.—(*By Telegraph.*)

The effects of the Coke famine upon the Iron and Steel industry in the Central West are more and more evident, affecting furnaces and foundries alike, causing intermittent production of both Pig Iron and Castings. In the Pig Iron market conditions are more chaotic, with a feverish temper and prices varying widely, but with a general tendency toward a higher level. The dizzy prices are deprecated by both producer and consumer, but without resulting in bringing about improved conditions. A sharp advance in the price of Scrap Iron and Steel is being reflected more generally in the Iron Bar situation, but with no large buyer in the market for Bars the effect is less apparent than it might otherwise be. Structural Material is quoted for next year's delivery only because the mills are unable to accept appreciable orders for such deliveries. The principal feature of the Rail market is a transaction in German Steel for early delivery, and the demand from railroads seems to be increasing and of a more urgent character even than during the past few months. Billets, both foreign and domestic, have exhibited a stronger tone with larger transactions in domestic make, but the higher prices asked are having the opposite effect upon the foreign manufacture. Light Sheets form the only notable weak spot, lower prices ruling from store. The almost unprecedented demand for machinery of all kinds has resulted in a very heavy consumption of large rounds of Machinery Steel. The mills making this grade of Steel are overwhelmed with orders for many months to come, and it is almost impossible to buy any appreciable quantities from stock.

Pig Iron.—The abnormal conditions prevailing have resulted in a chaotic market with prices irregular, covering a wide range even on the same grade and brand of Iron. It is difficult, if not entirely impossible, to secure appreciable quantities of Iron for the first six months of 1903, either of Northern or Southern brands. More Virginia and some foreign metal is finding its way into this section, but so sharp is the competitive demand that extreme prices are often paid. Most of the business seems to be skirmishing for spot Iron or its equivalent, shipments during the next 30 days. The demand is especially urgent for Silicon Iron, and sales have been made ranging from $30.50 for 4 per cent. to $32.10 for 8 per cent., but in exceptional instances premiums of $2 to $4 per ton have been paid over these prices. A few car lots of Southern No. 1 Foundry have been sold at $27.65 to $28.15, and No. 1 Soft at $28 to $28.65, No. 2 Foundry and No. 2 Soft selling within 50c. per ton of No. 1. Local No. 2 Foundry will command $27 to $28 for immediate delivery. Foreign High Silicon Iron has been sold at prices ranging from $26 to $28 for early delivery. Some Tennessee and Virginia Iron, No. 2 Foundry, has sold at $20.50, Birmingham basis, for April, May and June delivery, and No. 1 Soft as high as $21.50, Birmingham basis, for delivery running through April. An exceptional sale may be noted of No. 2 Foundry at $20.50, Birmingham basis, running through the entire year of 1903. While these are actual transactions they can scarcely be taken as a criterion for other contracts, as each transaction seems a law unto itself. The Coke famine is becoming more and more potent, affecting producer and consumer alike. More furnaces in the Central West are banked, and foundries are hampered by the intermittent fuel supply. The result is that both the production of Pig and the melting for castings vary considerably from day to day. Some more favorable advices have been received from the ovens in the New River and Pocahontas districts, but it will be some weeks before any relief can be experienced from this source. Under the circumstances the prices prevailing even for the first six months of next year are of a nominal character. The approximate quotations are as follows:

Lake Superior Charcoal	$26.00 to $27.00
Local Coke Foundry, No. 1	23.50 to 24.00
Local Coke Foundry, No. 2	23.00 to 23.50
Local Coke Foundry, No. 3	22.50 to 23.00
Local Scotch, No. 1	24.00 to 24.50
Ohio Strong Softeners, No. 1	25.50 to 26.50
Southern Silvery, according to Silicon	23.10 to 23.50
Southern Coke, No. 1	23.15 to 23.65
Southern Coke, No. 2	22.65 to 23.15
Southern Coke, No. 3	21.65 to 22.15
Southern Coke, No. 1 Soft	23.15 to 23.65
Southern Coke, No. 2 Soft	22.65 to 23.15
Foundry Forge	21.65 to 22.15
Southern Gray Forge	20.65 to 21.15
Southern Mottled	20.65 to 21.15
Southern Charcoal Softeners, according to Silicon	27.15 to 27.65
Alabama and Georgia Car Wheel	27.00 to 27.50
Malleable Bessemer	24.00 to 25.00
Standard Bessemer	25.00 to 26.00
Jackson County and Kentucky Silvery, 6 to 8 per cent. Silicon	27.60 to 28.60

Bars.—In sympathy with the higher prices prevaling for Pig Iron and Old Material the market for Iron Bars continues to harden, and while there is no special animation sales are made largely on the basis of 1.95c., Chicago, with concessions of 5c. to 10c. on desirable specifications. The market for Soft Steel Bars remains firm with liberal specifying on contracts, but new business is not of large proportions. The following are the prices current: Soft Steel Bars, 1.75c. to 1.90c.; Hoops, 2.10c. to 2.25c.; Angles, 1.85c. to 1.95c., base, mill shipments. There continues to be active call for Bars and Angles, but little demand for Hoops, from stock. Prices are as follows: Bar Iron, 2.25c.; Soft Steel Bars, 2c. to 2.25c.; Angles, 2.50c., and Hoops, 2.50c., from store.

Structural Material.—The inability of the mills to accept appreciable quantities even for next year's delivery is holding the volume of business within narrow limits. An effort was made to place a contract for 3000 tons for the Vendome Building during the week, and contracts for the new building adjoining the Marquette Building on the west and extending to Clark street, which will require between 8000 and 10,000 tons, would probably be placed could the mills accept the tonnage. There has been some inquiry for foreign Beams and Channels, but no business of importance has been reported. Domestic Steel, mill shipment, sells at the following prices: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 1.75c. to 1.85c. The demand from local stocks continues on a liberal scale, and the following prices are readily realized: Beams and Channels are wanted at 2.50c. to 3.50c.; Angles, 2.50c. to 3.50c.; Tees, 2.55c. to 3.50c. at local yards, but premiums are frequently paid for special sizes.

Plates.—The market continues extremely strong, with more business offering than the mills can readily take care of. The following are the prices current: Tank Steel, ¼-inch and heavier, 1.75c. to 2.25c.; Flange, 1.85c. to 2.35c.; Marine, 1.95c. to 2.50c. The demand from store shows no falling off, with full prices readily obtained: Tank Steel, ¼-inch and heavier, 2.30c. to 2.50c.; Tank Steel, No. 8, 2.45c. to 2.55c.; Flange, 2.50c. to 2.75c., all f.o.b. warehouse, Chicago.

Sheets.—The week has brought forth little if any improvement in the market for either Galvanized or Light Black Sheets. The offerings are liberal and the demand only moderate. For Heavy Sheets there is a fair inquiry and the market is steady. Quotations are as follows: No. 27 Black Sheets sell at 3.15c., mill shipment; small lots from store are offered at 3.25c. to 3.35c., Chicago. Mill shipments of Galvanized Sheets are held at 4.05c. to 4.25c., net, while small lots from store are selling at 4.30c. to 4.40c. for No. 27.

Cast Pipe.—A very strong tone continues to prevail in sympathy with the high prices for Pig Iron. There is a fair current order demand from private companies and railroads on the basis of previous quotations. About 6000 tons of 30's and 48's were sold to Washington, D. C., during the week. An important contract is pending at Los Angeles, Cal. Manufacturers continue to sell small lots in the open market as follows: 4-inch, $35.75 to $36; 6-inch, $33.75 to $34; 8-inch and upward, $33. Gas Pipe, $1 per ton higher than Water, f.o.b. Chicago.

Merchant Pipe.—There is a gradual improvement in the number of orders being placed, and the market has been steady without essential change in prices. Official prices, however, are without change, random lengths, Chicago, selling as follows: Black, ⅛ to ½ inch, 56½ off; ¾ to 12 inches, 63½ off; Galvanized, ⅛ to ½ inch, 43½ off; ¾ to 12 inches, 50½ off.

Boiler Tubes.—A fair degree of activity has been felt in the market, and the prices have remained steady for mill shipment as follows:

	Steel.	Iron.
1 to 1½ inches	42½	39
1¾ to 2½ inches	55½	38
2¾ to 5 inches	61	48
6 inches and larger	55½	38

From store there has been a fair demand. The market has remained firm at the following prices:

1 to 1½ inches	35	35
1¾ to 2½ inches	47½	32½
2¾ to 5 inches	55	42½
6 inches and larger	47½	..

Merchant Steel.—The volume of business continues very satisfactory in nearly all lines, and the market continues firm. It is notable that one of the largest mills reports shipments into this territory during the month of August as the largest both in tonnage and value ever experienced during any month prior to August. One of the principal features of the market is the relative scarcity of large sizes of rounds of Machinery Steel. The store trade continues quite satisfactory, with prices well maintained. For mill shipment prices are as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.95c. to 2.10c.; Open Hearth Spring Steel, 2.65c. to 2.75c.; Toe Calk, 2.25c. to 2.40c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 50 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted at 6½c. to 7c. for mill shipments; specials, 12c. upward.

Rails and Track Supplies.—There continues to be an active demand from Western railroads for Standard Sections, contracts aggregating 75,000 tons, one of 50,000 and others of small lots pending, but deliveries which can be promised are embarrassing to new business. If the contracts are placed most of the tonnage will probably go to Eastern mills. The most important transaction of the week is the selling of 35,000 tons of German Rails through the local representative of a foreign house to one of the Gould roads in St. Louis. The sale was made at about $33.60, Galveston. Official quotations for domestic Rails continue at $28 for Standard and $27 for second quality at the mill. There is quite an active demand for Light Rails, which are quotable at $32 to $45, according to weight and time of delivery. Track Supplies are in active demand and firm at the following prices: Splice Bars or Angle Bars, 2c.; Spikes, 2.50c.; Track Bolts, with Hexagon Nuts, 3.10c. to 3.45c.; Square Nuts, 2.95c. to 3.10c.

Billets.—A stronger tone has been developed in both domestic and foreign Steel, with an improved demand and sales of about 8000 tons domestic Basic Open Hearth Billets at about $37 for deliveries during the next six months. Small lots of domestic Open Hearth Forging Billets are held at $38 to $40, according to buyer, analysis and time of delivery. Much higher prices are demanded for foreign Billets, and on the basis of present quotations are quotable at $30.50 to $31, Chicago delivery, but buyers are holding off.

Old Material.—A much stronger tone has been developed during the past few days, and the market throughout the list has hardened, with an advance established on Old Iron Rails, Heavy Melting Steel Scrap, Steel Car Axles, No. 1 Railroad Wrought, Shafting, No. 1 Dealers' Forge, Machine Shop Turning, Mixed Borings, Heavy Cast Scrap, Stove Plate and Light Cast Scrap. The offerings have been

less ample and the demand more active if not urgent. The following are the prices current per gross ton:

Old Iron Rails	$25.00 to $25.50
Old Steel Rails, mixed lengths	18.50 to 19.00
Old Steel Rails, long lengths	23.50 to 24.50
Heavy Relaying Rails	30.50 to 31.50
Old Car Wheels	21.00 to 22.00
Heavy Melting Steel Scrap	18.50 to 19.50
Mixed Steel	15.50 to 16.00

The following quotations are per net ton:

Iron Fish Plates	$22.50 to $22.75
Iron Car Axles	25.00 to 26.00
Steel Car Axles	23.50 to 24.00
No. 1 Railroad Wrought	21.50 to 22.00
No. 2 Railroad Wrought	18.50 to 19.00
Shafting	20.00 to 21.00
No. 1 Dealers' Forge	17.50 to 18.00
No. 1 Busheling and Wrought Pipe	15.00 to 15.50
Iron Axle Turnings	14.50 to 15.00
Soft Steel Axle Turnings	14.50 to 14.75
Machine Shop Turnings	14.25 to 14.75
Cast Borings	10.25 to 10.75
Mixed Borings, &c.	10.50 to 11.50
No. 1 Boilers, cut	14.50 to 15.00
Heavy Cast Scrap	17.00 to 17.50
Stove Plate and Light Cast Scrap	12.50 to 13.00
Railroad Malleable	16.25 to 16.75
Agricultural Malleable	15.00 to 15.50

Metals.—A much stronger tone prevails for Copper, in sympathy with the sharp advance at primary points and prices of Lake have been advanced to 12¼c. to 12½c. in car lots and 12½c. to 12¾c. in a jobbing way. Pig Lead has sold well, with the supply inadequate to make prompt shipments. A firm tone continues, but prices remain unchanged at 4.05c. for 50-ton lots and 4.07½c. in carload lots. Sheet Zinc has remained firm with a good demand at 6½c. in carloads and 6.65c. in lots of 600 lbs. Old Metals are stronger, but prices are without essential change. Buyers are waiting to determine whether the recent advance will be maintained. The following are the prices current: Heavy Cut Copper, 10¾c.; Red Brass, 10½c.; Copper Bottoms, 9½c.; Lead Pipe, 3.80c.; Zinc, 3.65c.

Coke.—The market is chaotic. Deliveries on contracts are poor and sales in the open market of the little arriving are made at all sorts of prices ranging from $9 to $14. Even gas house Coke has been sold at $7 to $9, and Connellsville 72-hour Foundry Coke and West Virginia Coke has been selling at $10 to $12 per ton on track, Chicago, and in some instances even higher prices have been demanded. Foundries and furnaces are badly crippled, and more banking is reported.

Philadelphia.

FORREST BUILDING, September 9, 1902.

The only change in the market appears to be toward increased steadiness. Prices are not lower, but the impression gains ground that they are high enough, and by the exercise of a little patience there will probably be no necessity for paying more. This has undoubtedly been brought about by the heavy shipments from Europe and by the certainty that these shipments can be continued on the basis of present prices. With Pig Iron at prices ranging all the way from $19 on dock for fairly good qualities up to $23 for such as meets every requirement there is no reason for uneasiness, as there is a strong probability that hereafter conditions as regards supplies will be more favorable than they have been for months past. It is not to be supposed that prices are going to be much lower, but at $22.50 to $24 there is certainly no reason for fearing that there will be any such scarcity as there was during the earlier months of the year. In Steel this feature is still more distinctly evident. For a while it was next to impossible to get prompt Steel at any price, although $34 or thereabouts was the nominal quotation. To-day there is plenty of foreign Steel at $27 for Ordinary Bessemer and Open Hearth at from $28 to $30, which is far below the quoted rates for American Steel, so that current requirements are being met from abroad, not only for Pig Iron, but in the more advanced products as well. This, however, cannot be regarded as an unmixed evil, as without some such resources to fall back upon prices would have been dollars per ton higher than they are, and in many cases work would have been entirely suspended. So far, therefore, no harm has been done—but the reverse—the only question is how long and to what extent will the market be able to continue the absorption of foreign material. Large orders continue to be placed in foreign markets, and whether it will be needed or not it will certainly be shipped. The American market has been the salvation of the British and German markets this year. Ocean freights are lower than they have been for years, and our enormous crops will divert tonnage to our leading ports for months to come, so that freights will be very little more from European ports than from our own mills and furnaces. The one dominating feature for the present, therefore, will be large supplies of foreign material for months to come at prices not higher than those of to-day, and in case the home production increases there may be recessions more or less important, as a result of the competition which cannot be avoided, although it may be months before it becomes serious.

Pig Iron.—The excited feeling which was so strongly in evidence some time ago is materially abated. Consumers begin to realize that Iron will be forthcoming, and when prices get to $23 to $24 per ton no prolonged shortage need be feared. In all probability the severest pinch has already been felt, and while there is no reason to expect a surplus large enough to affect prices materially, yet it is almost certain that the outlook denotes that high water mark has been reached. This is indicated by less urgency to place orders for next year's deliveries, as well as less running around for spot lots. The latter are supplied to a great extent by English and Scotch brands, shipments of which appear to be so arranged that there is nearly always a cargo in port or near at hand. American No. 2 X Foundry for this and next month's shipments is readily taken at $23 to $23.50 (delivered), but rather than run around from place to place begging for Iron the rule is to "take a little Scotch," which can be had at the same figures and sometimes at less. The preference is always in favor of American Iron when it can be had, but there is a limit to a buyer's patience, as there is to the price that he is willing to pay. Moreover, by abstaining from new purchases there is a better chance to get deliveries on back orders, so that as we said before the feeling is much better than it was some time ago, when it appeared to be "Hobson's choice, that or nothing." Sales have not been unusually heavy, small and medium sized lots comprising the bulk of the business and mostly for foreign Iron. Prices are just about as they were a week ago. No. 2 X Foundry, $23 to $23.50 for this year's deliveries, $22 to $22.50 for the first quarter of 1903, and 50c. to 75c. less for deliveries covering the whole of 1903, but most of the sales are for the shorter dates. Scotch Iron sells at $22.50 to $23.50 on dock, duty paid, and Middlesbro at $20.50 to $21. These quotations are for small lots; cargo lots could be done at much lower figures, but importers require a good margin to cover the numerous risks and expenses on business of that character. The general list may be quoted as follows: Cargo lots, c.i.f., at about $19 for Middlesbro No. 3; small lots, $20 to $20.50 alongside, or delivered in buyers' yards $21 to $21.50. Scotch Iron ranges from $22.50 to $23.50, and American at about the same figures as quoted in our last, for city or nearby deliveries during the first half of next year, and $1 to $1.50 more for this year's deliveries.

No. 1 X Foundry		$23.50 to $24.50
No. 2 X Foundry		22.00 to 22.50
No. 2 Plain		21.00 to 22.00
Standard Gray Forge		20.50 to 21.00
Basic		20.50 to 21.00
Low Phosphorus	Prompt shipments or spot.	23.00 to 23.50
No. 3 Middlesbro		21.00 to 21.50
Scotch Irons		23.00 to 24.00

Billets.—A large business is being done in foreign Steel, but prices are lower than they were a week ago. Ordinary Bessemer can be done at less than $27 and Open Hearth at from $28 to $30, according to specifications.

Plates.—The demand for Plates is very good, and mills are in a comfortable position as regards work in hand. Some nice orders have been given out during the past week, lots of from 500 to 1000 and 1500 tons each having been taken by bridge builders, locomotive and car builders, tank builders and others, showing that business in all departments is in excellent condition. Prices are steady as last quoted, viz.: Small lots, 2.10c. to 2.15c.; carload lots, ¼-inch and thicker, 2c. to 2.05c.; Universals, 2c. to 2.05c.; Flange, 2.10c. to 2.20c.; Fire Box, 2.25c. to 2.30c.; Marine, 2.30c. to 2.35c.; Charcoal Plates, C. H. No. 1, 2½c.; C. H. No. 1 Flange, 3c.; C. H. No. 1 Flange Fire Box, 3½c.

Structural Material.—There is very little that can be said that has not been said in recent reports. Prompt deliveries command full prices, say 2.25c. to 2.50c. for mill specifications or for deliveries from store, but for long date deliveries the official prices of 1.60c., Pittsburgh, or 1.72c., Philadelphia, can be done. Deliveries on old contracts are something better than they were, but it is still necessary to pay the extra rates to secure deliveries within 30 or 60 days. The above quotations cover Beams, Angles, Channels, Tees, &c., according to date for delivery.

Bars.—The demand is not such as to call for special remark, as supply and demand are pretty evenly balanced. Some mills are full for several weeks to come, others keep busy on the day to day demand, which absorbs about the entire output. Prices are steady at 1.92c. to 1.97½c. for Refined Iron and 1.72c. to 1.80c. for Steel in carload lots as a minimum. The quotations for Steel, however, carry no guarantee as to date for delivery, except that it is to be as soon as the mills can catch up. September and October deliveries command 2c. to 2.15c., dates guaranteed.

Sheets.—The demand for Sheets is improving, and manufacturers are beginning to expect a larger business during the fall and winter months. Competition has been rather close, and prices have been sharply cut, but there is a firmer tone, and the following quotations are made for ordinary sized lots of Best Sheets (Common one-tenth to two-tenths less): Nos. 10 and 12, 2.30c. to 2.40c.; No. 14, 2.50c.; Nos. 16 and 17, 2.70c.; Nos. 18-21, 3c.; Nos. 26, 27, 3.10c.; No. 28, 3.30c.

Old Material.—The demand is fair, but prices are a little uncertain, varying according to circumstances. When material is needed full prices can be realized, but holders have to wait their opportunities. In a general way bids and offers for deliveries in buyers' yards are about as follows:

Old Steel Rails	$21.50 to $22.00
Heavy Steel Scrap	20.50 to 21.00
Low Phosphorus Scrap	27.50 to 29.00
Old Steel Axles	26.00 to 27.00
Old Iron Rails	24.00 to 25.00
Old Iron Axles	29.00 to 30.00
Old Car Wheels	20.00 to 21.00
Choice Scrap, R. R. No. 1 Wrought	23.50 to 25.00
Country Scrap	19.00 to 20.00
Machinery Cast	19.00 to 20.00
No. 2 Light Scrap	17.00 to 18.00
No. 2 Light Scrap (Ordinary)	15.00 to 16.00
Wrought Turnings	16.00 to 17.00
Wrought Turnings, Choice Heavy	18.00 to 18.50
Cast Borings	10.00 to 10.50

Cincinnati.

FIFTH AND MAIN STS., September 10, 1902.—(*By Telegraph.*)

As far as Iron for delivery in 1903 and 1902 is concerned there is no difference whatever in the situation. The amount of offerings with the exception of Forge Iron are so small and scattering as to hardly justify a quotation. The little that is selling is selling on the basis of $21.75 to $22.50, Birmingham, sales having been reported of a few cars at the minimum price named. The furnaces are in the main holding their Mill Iron, the asking price being in the neighborhood of $17, Birmingham, which is widely at variance from the purchasers' ideas. In reference to this grade bids have been tendered on the basis of $15 to $15.50, Birmingham, and consequently no sales have been reported. The time is now past for the old freight rates to be operative, and hereafter in the quotations the advanced rate of $3.25 to Ohio River points will be used. The Northern Irons for this year's delivery are in the main unchanged excepting Silveries, which are quotably higher. In regard to the market for next year's delivery it is undoubtedly higher than a week ago, and the minimum quotation to-day on No. 2 Southern Iron is on the basis of $18.50, Birmingham, at which figure quite a little amount of Iron is contracted for, one sale of 2000 tons being reported for delivery during the first three months of the year. A sale of a small lot of No. 2 Lake Superior Iron is quoted at $24.50 and another small lot at $25, at furnace, delivery being the latter months of this year. A sale of No. 2 Virginia Iron is quoted at $20 at the furnace. Freight rate from the Hanging Rock district is $1.10, and from Birmingham to Ohio River points $3.25. We quote, f.o.b. Cincinnati, for 1902 delivery, as follows:

Southern Coke, No. 1	$24.50 to $26.25
Southern Coke, No. 2	24.00 to 25.75
Southern Coke, No. 3	22.75 to 24.50
Southern Coke, No. 4	22.25 to 22.50
Southern Coke, No. 1 Soft	24.50 to 26.25
Southern Coke, No. 2 Soft	24.00 to 25.75
Southern Coke, Gray Forge	20.25 to 20.75
Southern Coke, Mottled	20.25 to 20.75
Ohio Silvery, No. 1	29.10 to 29.60
Ohio Silvery, No. 2	.... to ....
Lake Superior Coke, No. 1	26.10 to 26.60
Lake Superior Coke, No. 2	25.60 to 26.10
Lake Superior Coke, No. 3	25.10 to 25.60
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel, chilling grades	$26.75 to $27.75
Lake Superior Car Wheel and Malleable	25.00 to 26.25

Quotations for first six months of 1903, f.o.b. Cincinnati, the buyer to assume freight difference which may exist at time of shipment, are as follows:

Southern Coke, No. 1	$22.25 to $22.75
Southern Coke, No. 2	21.75 to 22.25
Southern Coke, No. 3	21.25 to 21.75
Southern Coke, No. 4	20.75 to 21.25
Southern Coke, Gray Forge	20.75 to 21.25
Southern Coke, Mottled	20.75 to 21.25
Southern Coke, No. 1 Soft	22.25 to 22.75
Southern Coke, No. 2 Soft	21.75 to 22.25
Lake Superior Coke, No. 1	24.10 to 24.60
Lake Superior Coke, No. 2	23.60 to 24.10

Old Material.—The market is active and practically unchanged. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, $20.75 to $21 per net ton; Cast Scrap, $16 to $16.50 per gross ton; Iron Rails, $24 to $24.50, gross; Steel Rails, long, $24 to $24.50, gross; Steel Rails, short, $18.50 to $19, gross; Iron Axles, $27.75 to $28.25, net; Car Wheels, $20.75 to $21, gross.

Iron Bars.—The general market is unchanged. The jobbers' Steel trade is reported to be very irregular, and accurate quotations almost impossible on account of the variation among the different houses. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.92., with half extras. Less than carload lots, 2.02c., with full extras; Steel Bars, 1.72c. for carload lots, with half extras; Base Angles, 2.25c. Plates 3-16 and heavier, 2.15c., carload lots.

The Field-Croxton Iron Company have been established as pig iron merchants. The members of the company will be H. A. Croxton, president; William Wieman, vice-president, and Robert Field, general manager and treasurer. The company will take over the business formerly handled by Mr. Field personally, and will, in addition, control the output of several large furnaces which he has not handled in the past.

St. Louis.

CHEMICAL BUILDING, September 10, 1902.—(*By Telegraph.*)

Pig Iron.—The state of affairs in the Pig Iron market is of a very quiet order, and while there is some little inquiry the indications point to the demand being satisfied for some space of time ahead. What business of importance does come to our attention is for the first half of 1903, and we have heard of some few thousand tons of Basic Iron negotiated for within the past few days. Eighteen dollars, Birmingham, for No. 2 Foundry seems to be the quotation generally adhered to for delivery the first half of next year. The following is the range of prices current for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	$21.50 to $24.00
Southern, No. 2 Foundry	20.75 to 23.25
Southern, No. 3 Foundry	20.25 to 22.75
Southern, No. 4 Foundry	19.75 to 22.25
No. 1 Soft	21.25 to 23.75
No. 2 Soft	20.75 to 23.25
Gray Forge	19.75 to 21.75
Southern Car Wheel Iron	19.75 to 22.25
Malleable Bessemer	.... to ....
Ohio Silvery, 8 per cent. Silicon	.... to ....
Ohio Strong Softeners, No. 1	.... to ....
Ohio Strong Softeners, No. 2	.... to ....

Bars.—The jobbers continue to report improvement in the demand and inquiry for Iron and Steel Bars, and trade conditions in this department generally are favorable. We quote from the mills: Iron Bars at 1.90c. to 1.95c. and Steel Bars at 1.90c. to 2c. Jobbers quote Iron Bars at 2.25c. and Steel Bars at 2.25c.

Rails and Track Supplies.—Conditions of demand are unchanged, and this department of the market is caring for a large volume of business. Much new inquiry shows. We quote as follows: Splice Bars at 2.10c. to 2.15c.; Bolts, Square Nuts, 3c. to 3.10c.; Hexagon Nuts, 3.25c. to 3.30c.; Spikes, 2.50c. to 2.60c.

Angles and Channels.—The demand is reported by the jobbing trade to be still increasing in volume. For material of this class 2.50c., base, is the quotation.

Pig Lead.—The demand for Pig Lead is on a very moderate scale, and in prices the same figures rule, Chemical at 4c. and Desilverized at 4.05c.

Spelter.—The demand for Spelter shows considerable decrease, and prices have accordingly fallen away somewhat. The asked price at this time is 5.12½c. to 5.15c.

Cleveland.

CLEVELAND, OHIO, September 9, 1902.

Iron Ore.—Shippers have made a combined effort during the past week to break the rate of carriage from Escanaba to Ohio ports. They wish to re-establish the 55c. rate, whereas the vessel owners have been demanding and getting in some instances 60c. The owners, however, have held together, and while the rate has not been broken there is a very light movement of wild material. The reports have just been received showing that the Ore movement down the lakes for the month of August was 4,067,000 tons, a gain of about 5000 tons over the same month for last year. This brings the total movement to September 1 up to over 17,000,000 tons. These figures make the total movement for the season of 24,000,000 tons not only possible but easy. Not this much has been sold and there is some little talk of more sales in the immediate future. The fact that the amount of Ore held in stock at lake ports April 1 this year was larger than ever before, on a movement last year of 20,000,000 tons, has made pertinent the question as to what is to be done with the additional 4,000,000 tons to be brought down this season, the answer to which is that no compulsory suspension of work will be necessary this winter among the blast furnaces except from a Coke shortage and that the new productive capacity in Pig Iron will demand, of course, an additional supply of Ore. All the Ore that is brought down, therefore, will be used.

Pig Iron.—The curtailment of production continues, and if it has not reached the alarming state it is at least perplexing. Most of the furnaces producing Foundry Iron which were out of blast a week ago have not resumed operations. It is pretty well established that the lack of motive power on the railroads, bringing a corresponding shortage of cars, is responsible for the condition of the Coke supply. The Coal shippers are far behind with their season's movement and are crying for cars; the Ore shippers are rushing to get their material down the lakes, and, of course, away from the docks, therefore need equipment, and the grain trade is just starting in. Under the circumstances, the best that may be hoped for by the furnaces for the

remainder of the season of navigation is an intermittent supply of Coke, and this is upsetting the Pig Iron market. Already the shortage of Pig Iron has gone to the point of compelling many of the foundries in this territory to suspend operations. Other foundries are running on a short supply of Pig Iron, and are in fear of this being cut off before long. The curtailment of production prior to this time had made it manifest that the blast furnaces will be compelled to deliver next year on this year's contract an amount of material equal to two months' production. Since the furnaces are falling far behind on their contract obligations the possibility of obtaining material on the open market at any price has about disappeared, and very little is being heard of such transactions. This has about precluded the possibility of making a quotation on Foundry grades that would be representative. The only thing indicative of the price to be obtained would be the statement that $25 a ton for No. 2 is about the minimum at the Valley furnaces. Southern furnaces are quoting $18, Birmingham, as a minimum, with an increasing demand in this territory. The Basic producers are in the same predicament as that in which the makers of Foundry Iron find themselves. Many of their furnaces have been out of service for the last two weeks, and only a few of them resumed operations yesterday, and can be expected to produce no standard Iron before the latter part of this week. All of this will have to be applied on contracts, and the only material which will be available for immediate sale will be the off Iron produced the early part of this week. The price continues to be $20.50 for off Basic, with material for the second quarter of next year quoted at $20 at the furnace, although the furnacemen are not anxious to contract at that figure. Bessemer producers are not an active factor in the market, making no quotations on future delivery.

Finished Iron and Steel.—Production of Bessemer Pig Iron has been curtailed to the point where many of the Steel mills are feeling it. Some of the mills in this territory have been complaining of a Coke shortage for the last three weeks or more and during that time the production has been less than the full capacity. There has also been a shortage of Billets for other reasons. Shippers having come to the belief that imported material is not satisfactory, use it only when able to get nothing better. The Steel mills having their own supply do not care to sell to outside buyers, because they have need for most all of the material they can produce. Then, too, they prefer to sell Bars when possible instead of Billets of less than 4 x 4 inch, for the reason that Bars will bring 1.60c., Pittsburgh, and the Billets a price about $30, delivered Cleveland. Under the circumstances the shortage of Billets may be a handy arrangement. The supply of Light Bars, Light Sheets and Tin Plate is still above the immediate demand and deliveries may be had promptly. In the Sheet trade, however, it is apparent that the demand is becoming more active and that the market is stronger. This, of course, pertains to the heavier gauges of Black Sheets and to 3-16-inch Plates. Prices have not changed from the last quotations made, being 3.10c. to 3.20c. for No. 27 at the mill, and 3.35c. to 3.50c. out of stock, most transactions here being of the latter sort. Galvanized Sheets delivered at Cleveland are commanding 4.50c. for No. 27 as a base. Bar Iron has been a center of interest lately because of better buying, which seemed to be sorely needed a week or more ago since the productive capacity had increased without a corresponding increase in the amount of sales. The new buying seems to have entirely overcome this difference and there is a good strong market. The report that the price was again down to 1.75c., Pittsburgh, is not confirmed and, in fact, it seems that the market is strong at 1.80c., the old agreed price. Steel Bars are firm at 1.60c. for Bessemer, and 1.70c. for Open Hearth. The lighter sizes are abundant, but large rounds are very scarce. Steel Plates have been sold up for the entire first half of next year and it is now next to impossible to get a big order in with any of the larger mills. Price conditions have not changed, the larger makers accepting 1.60c., Pittsburgh, for what they have to sell, while the smaller mills are getting 2.50c. for spot delivery and are inclined to ask a high price for what is sold for delivery after the first of January. Structural Steel has been selling well for the last week. Big companies are still booking orders for future delivery and are not closed out for the first half of the year. On such orders they are asking 1.60c. for mill shipments, while the jobbers are getting from 2.50c. to 3c. for what material they have and some of the smaller mills are also getting the same price for such material as they have uncovered or as they withdraw from contracts for the purpose of availing themselves of the benefit of the premiums. Few, if any, sales have been made at premium prices for next year's delivery. Very little is being heard about sales of Rails, although a few inquiries are coming in all the while for that material and it is found that the mills are not so far sold up for next year as to preclude the possibility of their taking a number of orders. No assurance is given the consumer, however, that he will obtain a very early delivery on material which is purchased now. Standard Rails are bringing $28.

Old Material.—The Scrap market has been staple and even during the last week, business being done on a modest scale despite the sore need of the foundries and the mills for Pig Iron. Prices do not change from the following: No. 1 Wrought, $19.50, net; Iron Rails, $27.50, gross; Iron Axles, 28, net; Cast Borings, $10, gross; Wrought Turnings, $15.25, gross; Cast Scrap, $16, net; Car Wheels, $19, gross; Heavy Melting Steel, $19, gross; Old Steel Rails, $20, gross.

Birmingham.

BIRMINGHAM, ALA., September 8, 1902.

As illustrative of the condition of the Iron market the general manager of one of the leading companies informed their president that he had sold some No. 2 Foundry Iron at $22. He said: "That is too high for Iron." "But," said the manager, "if it was too high the buyers would not pay it. They are glad to get it at that, and the price is now $23 for delivery in the next six months. At that price it is only 1c. per lb." The president said he had not taken that view of it, but he was satisfied it was the correct way to regard the market, and the price of Iron for delivery in the next six months is $23. And it is not every Iron maker who can accept orders for that delivery. The largest producers have registered enough orders to make them very comfortable on that delivery, and are indifferent sellers. For the time being some of them are entirely out of the market and are declining to quote prices for any delivery. When one interest enters the market it takes only a day or so to register all the orders they care to book. Then another interest follows suit until the rounds are made. It is hard to keep up with the market and it is often hard to tell what is the market. Conservative feeling is decided in the opinion that prices are as high as they ought to go. In fact, the largest and most influential interests would not growl a bit if prices were to recede. But how can they decline when there are more buyers than sellers who are bidding up the market on themselves, tempting cupidity to accept extreme figures? There are very few interests here that won't have to hustle in the next six months to fill their contracts, and if any untoward things happen, there will be no escape from defaulted deliveries.

The demand the past week shows no diminution. On the contrary it shows an increase over what has prevailed and the efforts to get in on a lot, no matter how small, are unceasing. The Foundry grades are most in demand, but any grade offering has no difficulty in finding a taker. As to price there is no guide. It is just what you choose to ask, provided you can give prompt shipment. Some No. 2 Foundry went at $23 and some went at $24. There are rumors of sales at less prices, but the man who sells at the inside price don't like to testify against himself. A little Gray Forge and some No. 3 went at prices that could not be verified, but are supposed to be around $19 for delivery the last quarter of this year and the first quarter of next year; prices have maintained their irregularity, and they have ranged from $21.50 to $23. At the outside figures the sales were smallest. There were no round lots reported at any price. It may as well be confessed that in the present condition of the market it is extremely difficult to get at the bottom facts concerning the various sales. It frequently happens that the seller, for reasons of his own, suppresses the particulars of a sale, and it must leak to you through a third party. A good deal of what you get just now is leaky information. So far, as a rule, it has been reliable, and very little has gone to your readers that was incorrect.

The idle furnace of the Sloss Company has been put in blast again. All their furnaces are now in commission. The Oxmoor Furnace of the Tennessee Company, it is expected, will be ready for the torch by October 15, but when that goes in blast another will probably go out, so it is anything but certain that all our furnaces will be going at one time in the near future.

Speculation has been rife over the action of the Tennessee Company in disposing of their holdings at Sheffield. The company officials on the ground here profess ignorance of the details, and reliable information of them cannot be obtained. It is understood that the sale is in the line of the declared policy of concentration as heretofore announced. All that is really known here is that for a specific period of time the Tennessee Company agree to furnish the purchasers with their necessary Coke supply. The property represented to the Tennessee Company an investment of over $800,000, and it is the belief that the price obtained was at least $1,000,000. The purchasers have confined their operations to the Sheffield district since their advent into the State, and but little has been known of their operations or intentions. It is gossip that they will enlarge their operations and be both progressive and aggressive. They are credited with possessing ample capital. They will have an abundant supply of the brown Ores.

The advance in the stock of the Sloss-Sheffield Company has let loose the tongue of gossip, and rumors concerning changes contemplated are very plentiful. The one to which much credence is given asserts that there is to be a consolidation of the interests of the Sloss-Sheffield Company and those of the Alabama Steel & Wire Company. No one here

can speak with any certain knowledge concerning the intentions of the interested parties. It is known that such an amalgamation was attempted some time ago, but it was nipped in the bud and failed of consummation. All that is definitely known here is that a strong body, financially, of Canadians have been buying the stock as an investment and have had parties here to thoroughly investigate the condition of the company and their resources. Since then they have added to their holdings. That is about the extent of reliable information concerning the move. What it means is a matter of conjecture. But there is a feeling that a war is on whose object is the controlling interest in the company. The battle ground is in New York. We are on the outer edge of the field and interested spectators.

In the reorganization of the Williamson Iron Company Frederick Dimmick of the Dimmick Pipe Works is announced as president and J. B. Simpson as secretary and treasurer. T. J. Edwards is general manager. The latter is a progressive furnace manager of ripe experience and approved capacity. His father was a pioneer in the establishment of furnaces in the South, and the son has been raised in the business. It is anticipated that the furnace will be ready for business by the middle of October.

There has been some improvement in furnace practice of late. The No. 3 furnace of the Republic Company at Thomas made one day the past week a run of 308 tons, and all of it Foundry Iron. They expect to improve upon that this week.

The Coke situation shows no improvement, and those dependent upon current offerings for their supply are ever on the alert to keep in stock. At their Flat Top coal mines the Sloss Company are rushing the construction of Coke ovens. They expect to have 100 ready by October 15 and another 100 ready by the middle of February, 1903. While Coke is still quoted at $4.75, those unprotected by contracts are paying materially higher prices. The demand for Coal continues fine, and the question of cars grows more serious as the season advances. All the important interests are behind on shipments, with the prospects poor for speedy relief. In the supply of Ore there has been some increase, and furnacemen are indulging the hope now of a regular supply. It is simply a question of sufficiency of labor. Some interests are fairly well situated in this respect, while others are more or less hampered by a lack of labor.

Plans are about completed for our new ten-story office building, and there are rumors afloat concerning other buildings to follow it. Intimations are unceasing of large enterprises to be shortly launched, but no positive declaration of what they are to be has been made, but there is an air of confidence that gives color to the nearby realization of what are, as yet, only great expectations.

Pittsburgh.

(By Telegraph.)

PARK BUILDING, September 10, 1902.

Pig Iron.—Unless the Coke situation materially improves within the next two weeks, and it does not promise to do so, there is no doubt that a very large tonnage of Foreign Bessemer Iron will be brought into the Pittsburgh district. Actual negotiations are now under way for the importation of at least 150,000 tons, which is to be divided around among three or four large Steel concerns in the Pittsburgh and Valley districts, who find it is utterly impossible to get Pig Iron as fast as needed for their Steel works. Some prices have already been submitted, and it is found that foreign Bessemer Iron can be laid down at $21.50, delivered, in the Pittsburgh district. The Coke situation instead of improving seems to be getting worse, and a number of blast furnaces that have had to bank quite often recently on account of scarcity of Coke will blow out unless the supply improves in a very short time. The chief trouble is not from lack of cars, as frequently stated, but is wholly from lack of motive power and terminal facilities. Two or three blast furnace concerns in the Shenango and Mahoning valleys practically got no Coke at all after Tuesday of last week. At this writing six or seven stacks are banked, and none of the furnaces are getting out anything like their maximum output. This is causing a famine in supply of Pig Iron, and prompt Bessemer has sold at $21.50 to $22, Valley furnaces. Should a large lot of foreign Iron be imported it will relieve the situation, and it looks now as though this would be done, as the supply of Pig Iron is getting shorter right along. Forge Iron is somewhat quiet, and is held at about $21.25 to $21.50, Pittsburgh. There is very little Foundry Iron for sale, and there is not much wanted as consumers have pretty well covered. Prompt Foundry Iron would bring very close to $23, Pittsburgh.

Steel.—The Steel market is so quiet and there is so little doing that it is difficult to name prices. Foreign Billets are being freely offered at $29, Pittsburgh, and Sheet Bars at about $30 to $30.50, delivered here. Domestic Steel could likely be bought for forward delivery at about $30, Pittsburgh, but $31 is asked for Steel for delivery within the next two or three months. Domestic Open Hearth Sheet Bars are being offered at $32, Pittsburgh. A good deal of Steel, both foreign and domestic, is being offered, so much, in fact, that buyers are afraid to buy ahead, being apprehensive of still lower prices. So many Sheet, Tin Plate and Wire mills are either idle altogether or else are running short handed that a good deal of Steel has been released, and it is now being offered in the open market. However, as long as prices of Pig Iron hold up where they are it does not seem that prices of Steel can go off very much.

Coke.—There is practically a famine in supply of Coke for prompt shipment, and furnaces in the East are said to be offering as high as $5 a ton for Furnace Coke where the seller will agree to ship right away. The belief is growing here that the beginning of the end of the Anthracite Coal strike is in sight and that the next two or three weeks may see it settled. The fact that the Norfolk & Western Soft Coal miners have gone back to work is support for this belief.

(By Mail.)

The situation in the Iron trade does not show any change whatever from that noted in our last report. There is still a great scarcity of Coke and Pig Iron for prompt shipment commands almost any price asked. A movement is on foot here among three or four of the leading Steel concerns, who are large buyers of Bessemer Iron in the open market, to import a round tonnage of foreign Bessemer Iron. The matter may assume such shape that a commissioner will be sent abroad to inquire into the Pig Iron situation, prices, &c., on the other side. The Steel market continues quiet and foreign Billets can be laid down at very close to $29, Pittsburgh, while domestic Steel is quoted at $31, but no doubt could be bought at lower figures. In Finished Material there is no change in the situation, either as regards demand or prices.

Muck Bar.—The market continues somewhat quiet, and we quote best grades of Muck Bar at $36, Pittsburgh. Eastern Bar can be bought at a lower price.

Structural Material.—A very heavy tonnage is being placed by the railroads for bridges and other work, to be done in 1903. All the Structural mills have entered heavy contracts for this class of work for next year's delivery. The outlook for 1903 could hardly be better, as tonnage promises to be even heavier than this year. A few orders for foreign Beams are being placed, but the tonnage is not very large. Prompt Beams and Channels continue to readily bring 2.50c. and higher. Official prices, which as already stated really apply only on deliveries for next year, are as follows: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inch, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c.

Rods.—It is said that the Rod market is a little stronger, and that Rods for prompt shipment are somewhat difficult to obtain. We quote Bessemer Rods at $36 to $36.50, f.o.b. Pittsburgh.

Steel Rails.—No large contracts have been placed since our last report, but the Canadian Pacific order for 50,000 tons will likely be given out within a short time. It is not probable, however, that domestic mills will get very much of this tonnage. We continue to quote at $28, at mill, on Standard Sections.

Ferromanganese.—No domestic is being offered, and we quote German and English Ferro at $51.25 to $51.50, Pittsburgh.

Plates.—Tonnage in Plates continues remarkably heavy, and it is said that a leading mill has turned down from 30,000 to 40,000 tons, being unable to make the deliveries wanted. Two or three of the leading Plate mills are sold up for this year, and have also entered a good deal of tonnage for 1903 delivery. Plates for prompt shipment continue to bring from 1.75c. to 1.85c. at mill, depending on the order. Official prices which really pertain only to Plates for shipment next year are as follows: Tank Plate, ¼ inch thick and up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days.

Hoops and Bands.—It is intimated that prices on Hoops and Bands have been recently shaded in occasional cases, and for good orders. The mills are fairly busy, but tonnage is not as large as it was some time ago. We quote Hoops at 1.90c. for 250-ton lots and over and 2c. in carloads. Bands are 1.90c. for Bessemer stock, 12-gauge and heavier, while for Open Hearth stock $2 per ton advance is charged.

Sheets.—There is no improvement to note in the Sheet trade, demand for both Black and Galvanized being very quiet. A number of mills are idle, which is cutting down the output of Sheets very much, and this ought to have a beneficial effect on the market. We quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 2.85c. to 2.90c., and No. 28 at 2.95c. to 3c. for carloads and larger lots. Galvanized Sheets are 75 and 5 off in carloads and larger lots, and about 75 off in small lots.

Bars.—A moderate amount of tonnage is being placed, both in Iron and Steel Bars, and the mills are comfortably filled, mostly on old contracts, however. Some mills now quote Iron Bars at 1.85c., Pittsburgh, and are holding at that price. We quote Steel Bars at 1.60c., at mill. All specifications for less than 2000 lbs. of a size are subject to the following differential extras: Quantities less than 2000 lbs., but not less than 1000 lbs., 0.10c. per lb. extra. Quantities less than 1000 lbs., 0.30c. per lb. extra, the total weight of a size to determine the extra, regardless of length. We quote Iron Bars at 1.80c. to 1.85c. in carloads and 1.90c. in small lots, f.o.b. Pittsburgh, half extras as per National card.

Merchant Steel.—There is a fair demand for seasonable Steels, but the market is without special change. We quote Tire, 2.15c. to 2.25c.; Spring, 2.25c. to 2.35c.; Toe Calk, 2.30c. to 2.40c., base; Sleigh Shoe, 2.15c. to 2.25c. Differentials are as follows: Less than 2000 lbs. of a size and not less than 1000 lbs., 10c. advance; less than 1000 lbs. of a size, 30c. advance; Cold Rolled Shafting is 47 per cent. off in carloads and 42 per cent. in less than carloads delivered in territory East of the Mississippi and North of the Ohio rivers. Tool Steel is 6½c. to 10c. for ordinary grades and 12c. and upward for special grades.

Merchant Pipe.—It is reported that an order is in the market for 300 miles of 6-inch Pipe for export, and is being figured on by some of the leading mills. Prices on Pipe are firm, being only slightly shaded in exceptional cases. Discounts to jobbers are as follows:

Merchant Pipe.	Black.	Galvd.
⅛ to ½ inch, inclusive	60	48
¾ to 12 inch, inclusive	67	55

Spelter.—We quote prompt Western Spelter for prompt delivery at 5.38½c. to 5.40c., Pittsburgh. Futures are quoted by the smelters at 5.25c. and 5.28½c., Pittsburgh.

Skelp.—The market is fairly strong, and we quote Grooved Iron Skelp at 2.10c., and Sheared at 2.15c., Pittsburgh.

Coke.—Output of Coke continues to break all record, and last week amounted to 254,853 tons for the Upper and Lower Connellsville regions. Prompt Furnace continues to bring from $4 to $4.50 a ton. Some contracts for Furnace Coke for next year's delivery have been made at prices ranging from $3 to $3.25 a ton.

Westinghouse, Church, Kerr & Co., selling agents for the Westinghouse Machine Company, have removed their offices from the first floor to the eighth floor of the Westinghouse Building, Pittsburgh. Two new departments have been organized, the engineering and construction department, in addition to the original sales department.

New York.

NEW YORK, September 10, 1902.

Pig Iron.—There are reports of further heavy purchases of foreign Pig Iron by importers, but we are unable to verify them. Consumers are buying moderate quantities of foreign Iron from importers right along. The most interesting development during the week has been the purchase by Rogers, Brown & Co., Pig Iron merchants of this city, of the Foundry Pig Iron product of the Dominion Iron & Steel Company of Sydney, C. B., for a period of six months. It is estimated that the tonnage amounts to about 7000 tons per month. There is practically no domestic Foundry Pig Iron available for prompt or early delivery, and the Southern railroads have advanced the rail and water freight to New York to $4.25. For delivery in 1903 the following quotations are made: Northern Iron, at tidewater, No. 1 X, $23.25 to $24.75; No. 2 X, $22 to $22.75; No. 2 Plain, $21 to $21.75. Tennessee and Alabama brands, in New York and vicinity: No. 1 Foundry, $23.25 to $23.50; No. 2 Foundry, $22.25 to $22.50; No. 3 Foundry, $21.50 to $22.

Cast Pipe.—Large contracts are now likely to be few, as the season is getting far advanced for arrangements to be made for extensive jobs of Pipe laying A good volume of business, however, is reported in small lots, which are coming in more freely than expected, as foundries are still unable to promise definite deliveries. Prices on such business depend on the quantity, character of the buyer, &c.

Steel Rails.—Inquiries for 1903 delivery continue to come in, and additional tonnage is being booked. To date the mills have taken 1,205,000 tons, which does not include the tonnage of the Colorado Works. This, of course, does not include the tonnage of Rails which may be carried over from this year into next, estimated at about 300,000 tons. Interest centers on the order for the Canadian Pacific road. It is understood that German bids have been as low as about $24.25, while the lowest English bids were $26.30. The contract, however, has not yet been closed. Under the prevailing circumstances none of the American mills are likely to participate in the order.

Manufactured Iron and Steel.—Contracts for at least 15,000 tons of bridge work have been placed the past week by railroad companies, which will be filled in 1903. The bridge manufacturers are so well supplied with work that it is doubtful if the contracts will be reached before the last half of the year. Much more railroad tonnage is under negotiation. Highway bridge work is quiet. The building trade is active, contracts for structural work in this line being quite numerous, and in some cases running up to fairly large quantities. Deliveries from the mills are a little better, but four months is the least time any of the manufacturers will promise on Structural Shapes, and then only on plain material in the common sizes. The demand for other classes of finished product is excellent, with every indication of continuance. We quote, at tidewater, as follows, but for small lots and prompt delivery much higher prices are being obtained for Structural Material and for Plates: Beams, Channels and Zees, 2c. to 2.25c.; Angles, 2c. to 2.25c.; Tees, 2c. to 2.25c.; Bulb Angles and Deck Beams, 2.10c. to 2.25c. Sheared Steel Plates are 2c. to 2.10c. for Tank, 2.10c. to 2.20c. for Flange, 2.25c to 2.40c. for Fire Box. Refined Bars are 1.95c. to 2c.; Soft Steel Bars, 1.95c. to 2.10c.

The Sheet Steel Company.—(*By Telegraph.*)—PITTSBURGH, PA., September 10, 1902.—The Sheet Steel Company of Pittsburgh have been organized and will apply for a charter of incorporation. The new company have leased the plant of the Tuscora Steel Company at Newcomerstown, Ohio, which contains four hot mills and four cold mills, galvanizing and proofing department. George A. McLean has been elected president and treasurer of the Sheet Steel Company and the offices will be in the Lewis Block, Pittsburgh.

The *Times* of Seattle, Wash., in its issue for September 4 states that the largest importation of steel rails in the history of Seattle will be made this month by W. D. Hoflus & Co. by the steamships "Ping Suey" and "Kintuck," of the China Mutual Line. The former is due September 15 with 2900 tons of rails and structural steel, and the latter will follow her a little later with 3000 tons of rails alone. The rails come from Belgium, the order having been placed last January. Heretofore it has been cheaper to purchase the American product, but the fact that the American mills are piled up with orders for delivery months ahead made it necessary for the firm to go into the foreign market to make their purchases.

The annual meeting of the stockholders of the Thomas Iron Company was held at Hokendauqua, Pa., on Tuesday, 9th inst. The old Board of Directors was re-elected as follows: Samuel Thomas, Wm. H. Hulick, F. R. Drake, J. S. Rodenbough, J. S. Krause, W. P. Hardenbergh and B. F. Fackenthal, Jr. They also re-elected the officers as follows: B. F. Fackenthal, Jr., president; Wm. H. Hulick, vice-president; James A. Weaver, secretary and treasurer. The reports of the officers showed a very satisfactory year's business.

The American Sheet Steel Company have recently installed at their Ætna Standard Works, Bridgeport, Ohio, a jobbing mill, which with other jobbing mills added during the last year makes seven jobbing mills at this plant. The American Sheet Steel Company are now installing at the Ætna Standard Works a three-high jobbing mill of the latest type which will be in operation in November.

The Salem Tool Company, formerly located at Salem, Ohio, have removed to Leetonia, Ohio, and changed their name to the Leetonia Tool Company, and at the same time have increased their capital stock to $10,000.

Struthers Furnace of the Struthers Furnace Company, which was banked for about a week on account of short supply of coke has again started up.

The New York Machinery Market.

NEW YORK, September 10, 1902.

In the machine tool trade there was considerable activity during the week under review. The first good sized order to be opened in some time was divided up and all the representatives of standard tool builders who could make reasonable deliveries went off with a slice. The distribution was done by the American Locomotive Company, who closed on a batch of machine tools variously estimated at from $75,000 to $100,000. The list comprised almost entirely medium sized tools. They are for installation in the company's Schenectady shops, which have occasioned several handsome purchases owing to the extensive improvements made at this point. The bulk of the orders just placed went to Manning, Maxwell & Moore, the Niles-Bement-Pond Company and the Prentiss Tool & Supply Company. The eyes of the trade have been following the American Locomotive Company very closely of late, as it has been known ever since their organization that marked extensions were planned. The Schenectady shops were the first to receive the attention of the company. It is expected that now their efforts will be devoted toward other shops. Important improvements are planned for the South, which will soon necessitate heavy purchases for the Richmond plant. A little has been done at the Brooks works at Dunkirk, but it is not thought that it will be necessary to spend much more on this plant for the present as it was in excellent condition and was undergoing extensions at the time of its absorption by the consolidation. The headquarters of the American Locomotive Company are in the Broad-Exchange Building, 25 Broad street, New York.

What is expected in the trade to prove a good fat list of machine tools is now being compiled by the General Electric Company. This concern have been one of the best customers in the Eastern machine tool market in ordinary times, as they are continually adding new equipment. Every one in the trade remembers the nice things they have done on special occasions, though, such as the equipment of Big 16, the great new machine shop at Schenectady. It is expected that they are preparing for another special occasion. We are informed on good authority that another great machine shop is now being planned. In fact, contractors are bidding on the building, which will be something like 135 x 800 feet. This new shop is to be equipped in the usual first-class style for the production of steam turbines on an extensive scale. We have previously referred to the fact that this company intended embarking in a new branch of trade. We have also informed our readers that the first large machine of this type has been ordered by the Commonwealth Electric Company of Chicago. In design, we are told, it will differ materially from the turbines now in use. It is to be a vertical machine, and instead of running horizontally will spin upright like a top, or like a cream separator.

It is reported in the street that the Lackawanna Railroad management are preparing for the erection of two new repair shops. One is to be located at East Buffalo and the other at Scranton, Pa. A short time ago the company purchased a fair sized lot of machine tools for installation at Scranton, and the report of the Scranton work may refer to the improvements already inaugurated there. While we have been unable to obtain official confirmation of the East Buffalo report we are advised from another source that work will commence there as soon as the contractors can get their apparatus to the site.

Persistent reports from the South state that the Baldwin Locomotive Works of Philadelphia intend establishing a branch in one of the Southern States. Memphis, Tenn., is named as the objective point. The reports state that a representative of the company spent several days there in conference with real estate men concerning the purchase of a site. The Baldwin Locomotive Works advise us that there is no foundation for the statement that they contemplate establishing a branch at Memphis, Tenn.

The New York Air Brake Company of 66 Broadway, New York, have decided to erect a large foundry at Watertown, N. Y., in connection with their works. Plans are not fully completed.

It is announced that the Buffalo plant of the Allis-Chalmers Company is to be closed down, and that the work performed there will hereafter be done at the new plant at West Allis, Wis.

The Raritan Structural Steel Company, whose New York offices are located in the Potter Building, 38 Park row, have just awarded contracts for the erection of a plant at New Brunswick, N. J. Twelve acres of land have recently been purchased for this purpose. The plant is to be equipped for the assembling, riveting, manufacturing and erection of general bridge and structural steel and iron work. They are now in the market for the equipment, which consists principally of punches, copers, facers, saws, cranes, shears, pneumatic tools, &c. Winfield S. Throp, the secretary and general manager of the company, is attending to the purchasing. The other officers of the company are Charles F. Terney, president and chief engineer; John Gerken, vice-president; Julian M. Pinkney, treasurer.

The Pusey & Jones Company of Wilmington, Del., obtained a substantial order for machine tools from the Standard Steel Car Company of Pittsburgh, who are erecting an extensive plant at Butler, Pa.

We are advised that the Draper Company of Hopedale, Mass., are making arrangements for the establishing of a branch shop in England. This concern, it will be recalled, are one of the largest manufacturers of cotton and textile machinery in this country.

A company have been recently formed at Shanghai, China, for the manufacture of sash, doors, blinds, moldings, stairways and general wood work with a capital of $100,000. J. C. Epperly and A. B. Ross, managers, will visit the United States during October to purchase a complete plant of the latest and best devices. While here their addresses will be: San Francisco, Cal., Palace Hotel, October 1 to 15; Chicago, Ill., Palmer House, October 20 to 25; Cincinnati, Ohio, Gibson House, October 26 to 30.

On October 21, 22 and 23 the Southern Supply and Machinery Dealers' Association will hold their convention at Memphis, Tenn. The business session will be conducted at the Hotel Gayoso. The principal discussions scheduled will deal with freight rates.

Trade Publications.

Screw Machine Tools and Attachments.—This is the name given to Catalogue No. 10, which has just been issued by the Garvin Machine Company of New York City. It is pamphlet form, 6 x 9 inches, and of 16 pages. Wood cuts are used to illustrate the tools and attachments.

Foundry Supplies.—The S. Obermayer Company of Cincinnati, Ohio, are having a series of leaflets and advertising novelties prepared to be sent to the trade each month. They have commenced the work by sending out blotters containing colored reproduction of paintings. They are also sending out a leaflet containing a reprint of P. R. Ramp's paper on "Economy in the Foundry," read before the Boston meeting of the American Foundrymen's Association. Another leaflet contains a treatise on foundry facings and blackings.

The Sorge-Cochrane System.—In a bright leaflet, entitled "That no Scale Shall Form in Boilers," the Harrison Safety Boiler Works of Philadelphia, Pa., describe their system of heating and purifying boiler feed water. The leaflet is an artistic creation in which a striking color scheme is attained. Another leaflet issued by this company is called "Economy for Collieries." This is a treatise on the Cochrane feed water heater and also touches on the Sorge-Cochrane system for heating and purifying feed water. The last page of this leaflet is perforated near the binding so that it may easily be torn out and mailed for more detailed information.

Split Wood Pulleys.—In an attractive booklet Keasey split wood pulleys with malleable iron hubs are illustrated and described by the Keasey Pulley Company of Toledo, Ohio. A complete line of this type of pulleys adapted for all purposes is shown. Besides the price-list for all sizes of pulleys the booklet contains rules for finding the size and speed of pulleys and for finding the length of belt required.

Coal, Ashes and Freight Handling Appliances.—An artistic pamphlet has just been issued by the Link-Belt Engineering Company of Nicetown, Philadelphia, in which are illustrated a few special applications of machinery in use in locomotive coaling stations and on docks and piers for the loading and unloading of vessels. Almost the entire 32 pages are devoted to illustrations and plans of the various plants mentioned. The typical coal and ashes handling plant shown was recently illustrated and described in *The Iron Age*. For the loading and unloading of vessels a number of styles of endless freight carriers are illustrated. It is evident that the pamphlet is intended to give a rapid and general sketch of methods of handling fuel and freight, as details are not dwelt upon. In this it is a success, and its mechanical execution is good.

Corliss Engines.—A nicely arranged, well printed booklet containing a partial list of users of Reynolds-Corliss engines has just been issued by the Allis-Chalmers Company, Edward P. Allis Works, Milwaukee, Wis. Classification is made according to the industry in which the engines are used. In addition to the general index referring to the classification there is an index of States and cities showing where a Reynolds-Corliss engine may be found in almost any locality on the globe.

"Sparks From a Fire" is the title of a pamphlet issued by Joseph T. Ryerson & Son, Chicago, to call attention to their Morison corrugated furnaces for boilers. The pamphlet is made up of a series of *fac-simile* telegrams received by the St. Paul Gas Light Company and the Western Packing Company from various users of boilers equipped with such furnaces in answer to inquiries. The pamphlet is the crystallization of a bright thought, and might have been appropriately called "Sparks From the Wire."

Engines and Boilers.—Two new catalogues have been brought out by the Ames Iron Works of Oswego, N. Y.

They are both of standard size, 6 x 9 inches, bound in pamphlet style and attractively prepared and printed. Only wood cuts are used in illustrating the boilers and engines. One of the pamphlets deals entirely with high speed engines. The other shows various miscellaneous types of engines and bolers, including elevations and sectional drawings.

Gas and Gasoline Engines.—The Acme Sucker Rod Company of Toledo, Ohio, have just issued a standard size, 6 x 9 inch, pamphlet, illustrating and describing the gas and gasoline engines which they build in connection with oil well supplies. The work is unique, inasmuch as each paragraph is preceded by a flowing quotation printed in red ink.

Mining Machinery.—Klein's combination classifier is illustrated and described in a ten-page pamphlet issued by the Fraser & Chalmers Works of the Allis-Chalmers Company, Chicago. One of the illustrations shows the 600-ton concentrating plant of the Desloge Consolidated Lead Company of Desloge, Mo., using Klein combination classifiers. The new principle embodied in this classifier is the use of compressed air with the water to effect the sizing. This, it is claimed, greatly reduces the quantity of water ordinarily required. The separation of all slimes and fines from the larger particles is accomplished by the constant agitation developed by the introduction of compressed air. The action of the air has a tendency to form small bubbles, which continually rise to the surface, carrying with them the slimes and fine material, which are carried off in the overflow with a minimum quantity of water. The air is introduced through one or more pipes from the bottom of the classifier transversely against the column of water introduced through a pipe near the bottom of the classifier. The classification is accomplished entirely by the compressed air, and the water used is only for the purpose of forcing out or discharging the sized product through the opening plate directly opposite and in line with the water supply pipe. In the classifier for coarse materials a spray of compressed air is introduced on an inclination against the water supply to cause an agitation which will prevent any slimes and fines being carried through the discharge opening with the classified material by the water supply. In the classifier for material ranging between 3 mm. and 1 mm. a mechanical agitator is used to assist in agitation of the pulp in the upper part of the classifier. In this manner the amount of compressed air required is reduced.

Power Transmitting Appliances.—The C. C. Wormer Machinery Company, Detroit, Mich., have just published a catalogue and price-list in behalf of the power transmission branch of their business. It is a neat, substantially bound booklet containing much information regarding patent steel shafting, wood split pulleys, drop hangers and floor stands, friction clutch couplings and pulleys.

Compressors and Blowing Engines.—A most complete book on Riedler compressors and blowing engines has been issued in its fifth edition by the Fraser & Chalmers Works of the Allis-Chalmers Company, Chicago. The book contains some 200 pages, 6 x 9 inches. Mechanically it is an excellent work. Its numerous half-tone engravings are well made and beautifully printed. The subjects in hand are exhaustively treated, and in addition to exploiting the Riedler machines in an able manner the book gives considerable real information of use to such as employ compressors or blowing engines of any type.

Perforated Metals.—Catalogue No. 7, ninth edition, just issued by the Allis-Chalmers Company, Fraser & Chalmers Works, Chicago, deals with this subject. It is pamphlet form, 6 x 9 inches, and attractively arranged and printed. The engravings illustrating the various styles of screens are reproduced from actual punched sheets. Printed in a light bronze gray tint they present a pleasing effect.

Machine Tools.—The Charles G. Smith Company, 347 Fifth avenue, Pittsburgh, Pa., have issued a more than usually attractive catalogue of 64 pages, illustrating the great variety of tools which they are offering. The company represent Hill, Clarke & Co., Safety Emery Wheel Company, Grant Tool Company, Eastern Machinery Company and George Gorton Machinery Company. The illustrations cover the specialties of these different companies. Dimensions and descriptions are not given, as those who desire such information are expected to apply for descriptive circulars, which give complete details. This enables a much greater number of tools to be illustrated within the limits of a moderate sized catalogue than would otherwise be the case. A price-list of friction clutch pulleys fills the concluding pages. The catalogue compares very favorably with any issued by manufacturers.

WYMAN & GORDON, manufacturers of steel forgings, Worcester, Mass., are issuing interesting advertising matter in the form of biographical sketches of prominent persons in the iron and steel trades. They have just issued as one of this series a short story of Sir Henry Bessemer, which is admirably written. The pamphlet is not only attractively gotten up, but is illustrated with a portrait of the distinguished inventor.

Metal Market.

NEW YORK, September 10, 1902.

Pig Tin.—Business throughout the entire week has been very quiet. Consumers were backward in buying, transactions being on a hand to mouth basis. It is said that the large consumers are still well supplied through old contracts. Prices have declined slightly since our last writing, closing prices to-day being as follows: Spot, 27c. to 27.35c.; September, 26⅞c. to 27¼c.; October, 26½c. to 27c.; November, 26c. to 26½c.; December, 25¾c. to 26¼c. The London market closed a little higher than last week, with £124 for spot and £119 5s. for futures. Arrivals thus far this month have been large, amounting to 1730 tons, while it is estimated that 2984 tons are afloat.

Copper.—After the dullness of the last two weeks a short lived boom set in on Friday. About six weeks ago it was made known in the trade that certain statistics were in preparation calculated to offset the universal opinion regarding the large supplies of Copper on hand. The appearance of these statistics occasioned the short movement in the market which set in on Friday. The figures presented were so favorable to a boom that the interests who have been endeavoring to maintain the market for some time promptly availed themselves of the opportunity to send prices upward. They were supplied with more Copper than they could well take care of, and consequently their operations did not survive a great length of time. It is even said that certain producers who have held out bullish reports were among the sellers, being glad to realize at 11¾c. for Lake. The circular referred to was issued by Ledoux & Co., who are well-known in the trade as assayers, but who have not figured prominently heretofore as statisticians. The circular states that on August 1 the total amount of Copper in stock amounted to only 62,165 tons, of which there were available only 31,045 tons. As a result of Friday's movement producers booked a handsome profit by making large sales, and even exporters who purchased Copper previously for export at low prices resold it in this market at a good profit. Since the upward movement commenced Lake sold as high as 12¼c.; Electrolytic brought from 11⅝c. to 12c., and Casting from 11½c. to 12c. Yesterday there was a slight reaction, and to-day the market was lower and very easy. The closing prices to-day were as follows: Lake, spot to December, 11.80c. to 12.25c.; Electrolytic and Casting, 11¾c. to 11.90c.; Standard, 11.20c. to 11.60c. The London market advanced to £54 7s. 6d., but reacted £1 this morning, closing at £53 7s. 6d. for spot and £53 15s. for futures. Best Selected had advanced just £2 as compared with last week, being £57 10s.

Pig Lead.—The market is quiet and firm. St. Louis is considerably firmer, while London has declined a shade. Smelting & Refining Company still quote Desilverized on a basis of 4.12½c. for spot and 4.10c. for futures. London is quoted £10 17s. 6d.

Spelter—Is quiet. Spot is still scarce, and held nominally at 5.50c. There has been a decline in St. Louis, prices dropping from 5.25c. to 5.15c. Shipments from the West are now freely offered here at 5⅜c The London market is unchanged at £19 7s. 6d.

Antimony—Is unchanged. Hallett's is quoted 8c.; Cookson's, 10c., and other brands, 7¾c.

Nickel.—No change is noted. Large quantities down to ton lots are now quoted at 40c. to 47c. per lb., according to size and term of order. Smaller lots are quoted as high as 60c., according to quantity.

Quicksilver.—The market is quiet and unchanged, the ruling quotation being $48 per flask of 76½ lbs. each in lots of 50 flasks or more. London is unchanged at £8 15s.

Tin Plates.—The market is dull and uninteresting, with an absence of any important buying. Prices are without change. The American Tin Plate Company are quoting for delivery up to December 1 on the basis of $4.19 per box for Standard 100-lb. Cokes, f.o.b. New York, or $4, f.o.b. Pittsburgh. The Welsh Tin Plate market has declined 1½ pence, quotations being now 12 shillings 4½ pence, Swansea.

The Toledo Safe & Lock Company of Toledo have been incorporated under New Jersey charter with $75,000 capital stock. Incorporators, Leo Schwab, John Klusmover, Charles R. Clapp and Morris Schwab. The company have just completed their new plant at Glassboro, near Toledo. They will manufacture steel safes.

In the census year 1900 the active blast furnace establishments in the United States were equipped with 1294 steam engines, with an aggregate of 494,789 horse-power.

The production of puddled bars or muck bar in Great Britain during 1901 was 974,385 gross tons, as compared with 1,162,765 tons in 1900 and 1,201,606 tons in 1899.

Iron and Industrial Stocks.

The stock market is attracting the attention of the public to a greater extent as prices advance. Railroad stocks have been steadily mounting upward since July, and industrials are now showing much more life. Sloss-Sheffield common has again been the leader the past week, so far as enhanced price is concerned, having reached 83. It is reported that a Montreal syndicate has taken the bulk of the stock on the present upward movement. United States Steel common showed the heaviest transactions, although fluctuating within narrow limits. United States Cast Iron Pipe suddenly developed great strength, the preferred touching 59 one day and the common 16⅞. Republic preferred and common were very active, and scored good advances. Crucible Steel common made a gain of some $3, as also did Pressed Steel common. Other Iron and Steel stocks were strong, with larger transactions.

The Sloss-Sheffield Steel & Iron Company report for the quarter ended August 31, 1902 (August estimated):

Net profit from operation	$347,168
Deductions for depreciations and charges to extraordinary repair and renewal fund	35,199
Total profits	$311,969
Deduct three months' accrued interest on bonds	$52,500
Deduct three months' proportion of taxes	7,500
	60,000
Net surplus	$251,969
Actual surplus carried over May 31, 1902	710,665
Total surplus	$962,634
Quarterly dividend on preferred stock	114,000
Total surplus to September 1, 1902	$848,634

The mines of the company during the quarter of which the above statement was made were closed down for a period of 14 days awaiting the adjustment of the miners' wage scale. The statement is also made officially that deliveries of pig iron during the quarter in question were made on the basis of $12 per ton for No. 2 Foundry, whereas the output for the first six months of next year has been sold on the basis of $17 per ton.

The New Haven Iron & Steel Company report for the fiscal year ended August 31 last gross sales of $693,195. Net profits were $68,023, against $75,629 in the previous year. The surplus on August 31 was $131,388, against $109,004 a year ago. The balance sheet as of August 31 shows: Assets—Plants and implements, $368,783; materials, $91,902; cash, $33,038; organization and charter, $8997; accounts receivable, $70,122; bills received, $14,530; stock and bonds, $48,327; total, $635,669. Liabilities—Capital stock, $500,000; accounts payable, $4281; surplus, $131,388; total, $635,669.

Bon Air Coal & Iron Company.—Thomas Plater & Co. of Nashville, Tenn., who lately offered at par a block of the first mortgage 5 per cent. bonds of the Buffalo Iron Company, say: "The Buffalo Iron Company and the Bon Air Coal, Land & Lumber Company recently consolidated with the following capitalization: Preferred 6 per cent. stock $2,500,000, issued $1,650,000; common stock $2,500,000, issued $1,650,000. The new Bon Air Coal & Iron Company assume the payment of the bonded indebtedness of the old companies as follows: Buffalo Iron Company, first and only mortgage on 70,000 acres of mineral and timber lands in Wayne, Hickman and Lewis counties, Tenn., including iron furnaces thereon, $264,000, and Bon Air Coal, Land & Lumber Company (6 per cent. bonds, 1928, first and only mortgage on about 30,000 acres of coal lands), $180,000. Earnings for 1901, exclusive of interest on bonds, sinking fund, taxes and all other items of expense are as follows: Buffalo Iron Company (net), $60,000; Bon Air Coal, Land & Lumber Company (net), $72,000; total, $132,000. Estimated increase in net earnings under the consolidation about $168,000; total estimated net earnings 1902, $300,000."

The directors of the Dominion Iron & Steel Company met at Montreal last week and completed final arrangements for taking over the property of the Dominion Coal Company on the basis of 8 per cent. dividend on the coal company's capital of $20,000,000. A check for $1,200,000, the rental for the past nine months on this basis, was handed over to the coal company. The directors of the steel company declared a dividend of 3½ per cent. on the company's preferred stock for the half year. The directors of the coal company also met and declared a dividend of 4 per cent. for the half year.

A special stockholders' meeting of the Cuban Steel Ore Company was recently held in Camden, N. J., to hear a report of the president of the company and to take such action as may be desired in view of the exhaustion of the mines and the imminent winding up of the company's affairs.

It is claimed that the present earnings of the Pressed Steel Car Company of Pittsburgh are at the rate of 20 per cent. of the common stock.

It is said that the Union Switch & Signal Company of Pittsburgh, have received orders this year from one railroad for more than $700,000 worth of equipment. Last year the total gross earnings reported by this concern amounted to but $1,600,000, and yet net earnings showed 26½ per cent. on both preferred and common stocks.

The annual meeting of the stockholders of the Westinghouse Air Brake Company will be held at Wilmerding, Pa., on October 7. Transfer books close September 25.

Dividends.—The New Haven Iron & Steel Company have declared a dividend of 25 cents a share, payable September 25.

The Otis Elevator Company have declared the regular quarterly dividend of 1½ per cent. on their preferred stock, payable October 15. Books close September 25 and reopen October 16. The $1,000,000 of additional preferred stock authorized will be offered to the common and preferred shareholders of record September 25. The transfer books of the common stock, as well as those of the preferred, will close on that date.

The Sloss-Sheffield Steel & Iron Company have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable October 1.

PERSONAL.

George J. Record, who established in 1882 the Record Can Company at Conneaut, Ohio, since absorbed by the American Can Company, has resigned the management of the plant and has been succeeded by C. T. Draper of the American Can Company's Cleveland branch.

Wilbur N. Ryer, long associated with the Crescent Steel Company as traveling salesman in the Western mining sections, has accepted a similar position with the Midvale Steel Company of Philadelphia, with headquarters at 220 Market street, San Francisco.

John W. Gates sailed for Europe by the White Star liner "Majestic" last week. He will be absent about six weeks.

A. D. Thomas has resigned his position as superintendent of the Chester Iron & Steel Works, Chester, Pa. The West End Rolling Mill Company of Lebanon, Pa., have engaged him as superintendent of their works.

Capt. T. A. Haughton has been appointed superintendent of the Woodward furnaces, at Woodward, Ala., a position which he formerly held.

Jonah L. Birch has been made master mechanic for all the mills of the American Steel Hoop Company in the Youngstown, Ohio, district.

The Youngstown Iron Sheet & Tube Company of Youngstown, Ohio, have commenced active work on the building of their new open hearth steel plant. The output of this plant will be used by the concern in the manufacture of sheets and pipe, as it is the intention of the Youngstown Iron Sheet & Tube Company to manufacture both iron and steel pipe for the market. The company have been making wrought iron pipe for some time and are turning out about 300 tons a day.

One steel building, 50 x 150 feet, formerly occupied by the Ellwood Works of the American Tin Plate Company at Elwood City, Pa., is being removed to New Castle, Pa., and will be erected near the Shenango Works. It will be used for an annealing box and stand factory.

We are officially advised that the report that the W. Dewees Wood Works of the American Sheet Steel Company, at McKeesport, Pa., would be very much enlarged and three new sheet mills added is untrue. Beyond the usual ordinary repairs no changes are to be made at these works.

The Elliott Blair Steel Company, New Castle, Pa., makers of fine cold rolled steel, are running their works to full capacity and report business much better than usual at this season of the year.

The output of pipe at the National Works of the National Tube Company at McKeesport, Pa., in August was the largest in any one month in the history of that plant and amounted to over 1000 tons a day for 26 days.

Chester Industrial News.

The Fournier-Searchmont Automobile Company of Philadelphia, Pa., have purchased two mill sites and about 75 acres of ground. The company are organized under the laws of New York and have some valuable patents for motor vehicles. They have capitalized at $2,000,000, with $1,500,000 paid in, and when all of the contemplated improvements are completed will have one of the largest plants in the world for building the motor carriages and wagons. It is the intention of the company, in addition to the buildings already on the premises, to erect a new machine shop, which will be 150 feet wide, over 300 feet long, and two stories high. This, with the other buildings, will give a floor space in the entire plant of 265,000 square feet. The board of directors are: E. M. Robinson of the banking house of J. P. Morgan & Co., New York; Foxhall Keene, banker, of New York; J. L. Elliott, banker, of New York; C. J. Peabody, banker, of New York; E. R. L. Gould of New York, Thomas B. Wanamaker, owner of the Philadelphia *North American*. The officers are: President, J. Blum of Philadelphia; secretary and treasurer, Barclay H. Warburton, proprietor of the Philadelphia *Evening Telegraph;* general manager, E. B. Gallahar.

Two new traveling cranes have been placed in the works of the Penn Steel Casting & Machine Company. One has a capacity of 20 tons and the other 25 tons. The Morgan Engineering Company of Alliance, Ohio, built and installed them.

The Chester Iron & Steel Works are idle because of the difficulty in procuring material. There is no steel on hand with which to fill orders.

The United States Charcoal Iron Company have been incorporated with a capital of $750,000 for the purpose of manufacturing charcoal iron by a new process just invented by J. Jones Hudson. By the new process it is stated that a greatly increased output can be secured at much lower cost than by old methods. The inventor has been elected president and general manager of the new company. Mr. Hudson was formerly manager of the Crum Lynne Iron Works. The exact location of the new plant has not yet been determined, but there is every prospect of its being built in the vicinity of Chester, Pa.

Iron City Spring Company.—The Iron City Spring Company of Pittsburgh were recently granted a charter of incorporation and will engage in the manufacture of railway springs. The new company have bought the Fox Works of the Pressed Steel Car Company, and this plant will be immediately equipped and put in first-class condition for the manufacture of railway springs. The capital stock of the company has been increased to $500,000, and officials have been elected as follows: D. C. Noble, president; W. H. Gardner, assistant secretary, and George W. Little, assistant secretary. The directors are D. C. Noble, James Neals, T. Hart Given, L. C. Noble, H. K. Porter, Thorton N. Motley and Henry Aiken. Nearly all of the above are engaged in the manufacturing business in Pittsburgh. It is expected to have the plant ready for operation about January 1, and the output is expected to be from 40 to 50 tons of railway springs per day.

The Lake Superior Iron Company, Marquette, Mich., have contracted for a two-story office building, to cost $16,000. Its dimensions will be 55 x 71 feet. The building will be of brick with red sandstone trimmings. In the basement will be a storage vault, bowling alley and two private rooms. The general and private offices will be on the first floor. A reading room, billiard room, and smoking room with ingle nook will be on the second floor.

The Commonwealth Steel Company.—The Commonwealth Steel Company have started a large foundry at Granite City, Ill., and are in a position to make prompt deliveries of steel castings running from 25 to 5000 pounds in weight.

OBITUARY.

S. W. SESSIONS.

Samuel W. Sessions, president of the Lamson & Sessions Company, died at his residence, Cleveland, Ohio, on the 7th inst. The cause of his death was a paralytic shock received about a year since. Mr. Sessions was born in Burlington, Conn., October 8, 1826. He removed to Cleveland in 1870, when the bolt and nut manufacturing business of the Lamson & Sessions Company was removed to that city from Mt. Carmel, Conn. Mr. Sessions had been in the employment of the company for ten years. Soon after his removal to Cleveland he acquired an interest in the business and gradually became influential in the management. He was also a director of the Union Rolling Mill Company and of the Savings and Trust Company. Mr. Sessions was for many years prominent in public affairs, taking great interest in charitable institutions. A widow, one son and one daughter survive him.

NOTES.

WILLIAM HENRY PICKERING, engine builder and manufacturer of Hartford, Conn., died on the 2d inst. from a complication of diseases. He was born in New York City in May, 1847, and shortly after the Civil War he became well known as a mechanical engineer, superintending the construction of manufacturing plants in this country and in Europe. In 1883 he organized the firm of W. H. Pickering & Co., which he controlled up to the time of his death.

JOHN A. ERVIEN of Myers & Ervien Company died at Ogontz, Pa., on August 20. He was born near Hartsville, Bucks County, Pa., August 18, 1823. He learned the trade of millwrighting with his father, following the same until July 1, 1850, at which time he went into the manufacture of forks with Jacob R. Myers, the firm being known as Myers & Ervien. Each of the partners contributed $1400 capital. In 1894 the firm were incorporated under the name of the Myers & Ervien Company, Mr. Ervien serving as treasurer of the company from that time until his death. He was active in the business until about six weeks ago, and it is interesting to know that his business career in the line of the manufacture of forks extended for over 52 years.

The American Foundrymen's Association have issued as a souvenir of their seventh annual convention a cloth bound volume containing a report of the proceedings at the Boston meeting on June 17 to 19, 1902. The volume contains all the papers presented at the convention, a stenographic report of the discussions and action on resolutions, numerous illustrations of points of interest in Boston and photographic reproductions of interesting occurrences which took place during the excursions of the association to various points in Boston and vicinity. The volume has been prepared by the secretary, Dr. Richard Moldenke, P. O. Box 432, New York City.

During the next week the wage scale governing bar iron, sheet and tin plate mills will be arranged for September and October. It is expected that the average price of iron bars shipped out by the mills in July and August will give puddlers an advance in wages. In July and August puddlers were paid $6 a ton, based on a 1.6 card. In case it is found that the price of shipments for iron bars in July and August is 1.70 cents, it will entitle puddlers to an advance of 12½ cents for puddling and finishers, 2 per cent. There will no doubt be a change made in the sheet and tin plate scales, as prices on both of these commodities have not advanced for some time, but on sheets are slightly lower.

The Slag Committee, composed of representatives of lines entering the Pittsburgh district, held a special meeting in Pittsburgh on September 9 for the purpose of formulating rates on slag. It has been the custom of the railroads for some time to haul slag free for filling purposes, but in the future a charge will be made for hauling this material.

HARDWARE.

DURING the summer there was probably a more general recognition of the vacation season than is usual. The stress of business during the first half of the year was especially taxing and many charged with serious responsibilities found it desirable to preserve and renew their energies by a respite for a longer or shorter time from the pressure of business cares. At the same time the fact that more than the usual profit was in many cases the reward of their labors made it easier to spend at least part of the summer in rest and pleasure. As a consequence of this condition of things business has felt the effect of the withdrawal from its active prosecution of those whose enterprise and energy have much to do with keeping up its volume and giving it tone. The subordinates, too, in the various business establishments have felt the influence of the vacation spirit, and while there has been a diminished force of workers there has been also a relaxing of the efforts which have been put forth for the carrying on and extension of trade. There has been a general feeling, only half defined perhaps, but none the less real, that it was sufficient to take care of the routine of business and of the matters which presented themselves from day to day without attempting much in the way of aggressive effort or the devising of new plans. One of the rewards of long continued labor is the privilege of laying it aside and enjoying a well earned respite from the tasks which at other times call for close application and the best energy and thought.

The vacation comes, however, with a view to the future rather than the past. Its practical usefulness should be found largely in the preparation it gives for resuming work with renewed strength and zest. During the summer months there has been more or less interruption of the regular course of business, but with the opening of the fall this disturbance has ceased and trade returns to its wonted channels to assume presumably an increased volume. Those in direction of business enterprises should take hold again, not only with the mental and physical benefit which the vacation afforded, but with an intelligent effort to introduce into the direction of the business any new features, in the spirit which characterizes it, in its scope, in the details of its management, which will tend to give it a larger success. There should be a more efficient working on approved lines, with the application perhaps of increased energy and enterprise. Difficulties and obstacles which lie in the way of a greater success should be considered and encountered anew with a view of discovering some way by which they can be overcome. Candid recognition should be given to the fact that business conditions and methods are constantly changing, and that there is a necessity for modifying plans and methods accordingly. It may be feasible to add some new feature or new line of goods, or in some way to make in a conservative and yet progressive spirit something of a new departure. Every wideawake merchant and manufacturer has in mind plans and projects, perhaps only vaguely outlined, some of which in all probability if put into operation would contribute to his success. At least some of these should be considered in a definite and practical way. There should certainly be a resumption of direction in an earnest and enthusiastic spirit, and an aim to induce throughout the establishment a similar tone. If the time allotted to recreation and pleasure has the effect of giving this preparation for more efficient direction it will have been well spent and will contribute not a little to both the satisfaction and profit with which the business, manufacturing or mercantile, is conducted. Fortunately the conditions which prevail are full of promise, and it may be in a hopeful spirit that the work of the opening season is resumed.

Condition of Trade.

There are indications of increased activity in the purchase of Hardware. Orders are coming in to manufacturers in very satisfactory number and volume, especially considering the fact that the jobbing trade covered their requirements liberally some time ago. Both jobbers and retailers are preparing for a business of good volume during the fall. The general conditions of prosperity and the way in which trade kept up during what are usually regarded as the dull months justified this. There continues to be, notwithstanding the opportunity which the summer afforded for the clearing of order books, much difficulty in getting goods of various kinds, the manufacturers being unable to make anything like prompt shipments in several lines. The fall season is, in fact, entered upon with back orders on many of their books and with warehouses practically empty. There still continues to be much correspondence with a view to hurrying up shipments. Some prominent jobbing houses are urging their customers to purchase the goods needed for fall and winter trade at an early date in order to avoid delay and disappointment. The manufacturers are handicapped in the turning out of their products by the difficulty in many cases of obtaining raw material, and in a good many factories strikes and labor disturbances have interfered with the regular operation of the works. The active demand and the profitable business which is doing, for manufacturers are obtaining more adequate margins of prout than has often been the case, have the effect of inducing a good deal of enterprise in the way of increasing manufacturing facilities. This is the case both with factories which are being extended and in the installation of new plants. In this way the producing capacity of the trade is being constantly increased, but up to this time the demand in many lines exceeds the supply. With the prevailing prosperity the trade are buying such goods as they require without questioning as to the stability of prices, but are refraining from placing speculative orders, desiring to be on the safe side when the reaction comes. The slight weakness which characterizes a few lines which have been high or in which new competition has interfered with association control is regarded as a desirable feature and not indicative of any general weakness in the market, which continues to be pervaded by a strong and confident tone.

Chicago.

(By Telegraph.)

Taken all in all, the business in jobbing lines of Hardware is entirely satisfactory. There is less cutting than usual in prices of standard goods and specialties are well maintained. All kinds of cast iron goods are tending upward strongly, and an advance is anticipated in most lines of Steel goods. The volume of business in fall lines, such as Stove Boards, Elbows, Coal Hods, Axes, Shovels and Scoops, is of satisfactory proportions and increasing from day to day. The movement in heavy goods, such as Galvanized and Black Sheets, Tin Plates, Planished Iron and Polished Steel, as well as Bars, Rounds, &c., is steadily increasing. Low prices still prevail on Galvanized and other Light Sheets, but Planished Iron and Polished Steel are very scarce and very strong. A little firmer tone prevails for Copper Sheets, in sympathy with the crude metal, but prices are

unchanged. The orders received for Nails and Barb Wire are larger and more frequent, some urgent orders being received by wire, indicating that stocks are light in the hands of the trade. There is an increasing order trade for Enamel Goods and Cutlery, and one feature of interest, usual at this time, is the liberal buying of Toys for the holiday trade. Manufacturers of some lines of Lawn Mowers have advanced prices for next year's delivery 5 per cent., and salesmen are active throughout the country. There is a good, steady consumptive demand for Screws, with an occasional liberal order from jobbers, but manufacturers are not buying with any unusual freedom. Prices show little variation. There is an increased buying of Builders' Hardware and Carpenters' Tools from jobbers' stocks. There are one or two large contracts for Builders' Hardware pending in this section, but as a rule business is now confined more especially to the jobbing trade. Manufacturers while still well supplied with orders are less rushed and are able to make more satisfactory deliveries. There is quite an active movement in Shelf Hardware and a liberal distribution of Wringers, Washboards and other specialties.

St. Louis.

(By Telegraph.)

Trade in the Hardware market is in most satisfactory shape. Liberal individual requirements and the disposition of the dealer to keep stocks complete makes the call on the jobber of very large proportions. The present broadening tendency continuing, September will undoubtedly mark a new high record for sales. Individually some of the jobbers now report that the previous records in their establishments have been surpassed. Even now a light call is reported for some classes of spring goods, which fact seems significant. While trade is now forging ahead so rapidly in the heavy department a gradual broadening is noticeable and the promise is for a good, substantial fall demand.

NOTES ON PRICES.

Wire Nails.—The month thus far has shown some improvement in demand. Quite well authenticated reports are to the effect that some of the outside mills are offering a rebate of 5 cents per keg on desirable orders to jobbers. This deviation from regular quotations is not regarded as foreshadowing a general break in prices. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots	$2.05
To jobbers in less than carload lots	2.10
To retailers in carload lots	2.10
To retailers in less than carload lots	2.20

New York.—Jobbers have received an increased number of orders during the past week, with a disposition shown on the part of some of the trade to place contracts for future shipments. A fair business in small lots from store is being done. Jobbers' stocks suffer somewhat in assortment owing to delays in transportation. Quotations are as follows: Single carloads, $2.20; small lots from store, $2.25 to $2.30.

Chicago, by Telegraph.—A good order trade has been experienced during the week by both manufacturers and jobbers and considerable ordering by wire gave evidence that stocks in the country are light. The market has remained steady, with sales of single car lots at $2.15 to $2.20 and small lots at $2.25 to $2.30 from store.

St. Louis, by Telegraph.—A better demand continues for Wire Nails and conditions in this department are well up to the normal. Car lots are quoted at $2.25 and small lots from store at $2.30.

Pittsburgh.—There is nothing of special interest that can be noted in the Wire Nail trade at this time. Demand continues light. There is more or less unevenness in prices of Wire Nails in spite of the efforts of manufacturers to hold the market firm. We quote Wire Nails at $2.05, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, and note that this price is sometimes shaded on carloads or larger lots about 5 cents a keg.

Cut Nails.—The output of Cut Nails by the mills, owing to the high price of steel, is not always sufficient to supply even the fairly good demand. Quotations are as follows: $2.05, base, in carloads, and $2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

New York.—The local demand for Cut Nails is moderate. Quotations for carloads and less than carloads are as follows:

Carloads on dock	$2.18
Less than carloads on dock	2.23
Small lots from store	2.30

Chicago, by Telegraph.—Both Iron and Steel Cut Nails are selling well and prices are well sustained. Carload lots are quotable at $2.20, base, and in jobbing lots at $2.30, base, from store.

St. Louis, by Telegraph.—Very little is doing in the market for Cut Nails and the quotation for small lots from jobbers' stocks remain at $2.40.

Pittsburgh.—We note a fair demand for Cut Nails, and the tone of the market is strong. There is still some trouble in getting prompt deliveries, owing to inadequate facilities of the railroads. We quote Cut Nails at $2.05, base, in carloads and $2.10 in less than carloads, plus freight in Tube Rate Book to point of destination.

Barb Wire.—There are no indications of a marked revival in the demand for Barb Wire. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days:

	Painted.	Galv.
To jobbers in carload lots	$2.60	$2.90
To jobbers in less than carload lots	2.65	2.95
To retailers in carload lots	2.70	3.00
To retailers in less than carload lots	2.80	3.10

Chicago, by Telegraph.—The improved demand previously noted has continued and the market has remained steady at previous prices. Galvanized sells at $3 to $3.05, and Painted at $2.70 to $2.75 in car lots, with 5 cents extra for small quantities from store.

St. Louis, by Telegraph.—In line with other products in the Wire market, Barb Wire continues to meet with a better demand. In small lots from jobbers' stocks Painted is quoted at $2.90 and Galvanized at $3.20.

Pittsburgh.—The market continues very quiet and is only fairly strong. On carloads and larger lots some manufacturers usually allow a rebate of about 5 cents per 100 pounds. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Painted, $2.60; Galvanized, $2.90; less than carload lots, Painted, $2.65; Galvanized, $2.95.

Plain Wire.—A moderate demand exists for Plain Wire. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots	$2.00	$2.40
To jobbers in less than carload lots	2.05	2.45
To retailers in carload lots	2.05	2.45
To retailers in less than carload lots	2.15	2.60

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9	Base				$0.40	extra.
10	$0.05	advance	over	base	.40	"
11	.10	"	"	"	.40	"
12 and 12½	.15	"	"	"	.40	"
13	.25	"	"	"	.40	"
14	.35	"	"	"	.40	"
15	.45	"	"	"	.75	"
16	.55	"	"	"	.75	"
17	.70	"	"	"	1.00	"
18	.85	"	"	"	1.00	"

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—While there has been no special change the market has been active and prices have remained steady. Carload lots are quotable at $2.10 to $2.15 on track, and jobbing lots at $2.20 from store.

St Louis, by Telegraph.—Jobbers are meeting with a demand and inquiry for Plain Wire of a moderate order

and continue to make the same quotations. Small lots from stock of No. 9 at $2.25 and Galvanized at $2.65.

Pittsburgh.—There is a moderate demand, mostly, however, for small lots. Prices are only fairly strong, a concession of about 5 cents per 100 pounds being allowed to large jobbers for carloads and larger lots. We quote Plain Wire at $2, base, and Galvanized at $2.40 in carloads, f.o.b. at mill.

Nichols Bros.—Nichols Bros., Greenfield, Mass., are selling their line of Butcher Knives, description of which is given on another page, and Boning, Sticking and Skinning Knives, from the following list, which is subject to a discount of 50 per cent.:

Butcher Knives.

Inches	5	6	7	8	9
Per dozen	$4.40	5.70	7.60	9.70	11.30
Inches	10	11	12	13	14
Per dozen	$14.20	16.80	18.90	22.00	26.30

Boning, Sticking and Skinning Knives.

Inches	5	6	7
Per dozen	$4.40	5.70	7.60

Steel Goods.—No further definite action has been taken in regard to the consolidation of the interests of Steel Goods manufacturers. It is expected that a meeting will be held this week, at which it is not unlikely that something definite may be determined. Pending the negotiations manufacturers are refraining from making prices for next season.

Sad Irons.—For some time past the Sad Iron market has been gradually stiffening, owing to the increasing cost of the raw material and the large demand made upon the manufacturers. A further slight advance has recently been made in this line, the tone of which continues steady and strong. The market is represented by the quotation of 2½ to 2¾ cents for large lots of the common Sad Iron.

Steam Gauges.—The manufacturers of Steam and other Gauges, who for some time past have been carrying on a ruinous competition, came to an understanding September 5 by which prices have been advanced so that a legitimate profit can be made by the manufacturers. Before the last era of low prices began the base discount was 60 per cent., which has now been placed at 65 per cent., the extras being determined by the class of buyer and the volume of his business. Prices previous to the change last week had gotten as low as 80 and 10 per cent. in extreme cases. While the present prices show advances in some instances of over 75 per cent. it is claimed by the manufacturers that prices in such cases had been cut to less than manufacturers' cost, especially on 5-inch gauges.

Roofing and Building Papers.—The market for Building and Roofing Papers is in a normal condition so far as prices are concerned, but there is plenty of business and manufacturers are slow in executing orders; consequently there is no special reason for cutting prices. Dealers in close touch with the trade in these lines say the consumption of Tarred Roofings, &c., is increasing all the time, a situation that is not explained by the natural increase due to good business conditions. A large part of this growth is attributed to the supplanting of Tin roofs by the various kinds of Tarred and Asphalt Roofings, both regular and prepared. One reason given for the change is the inferior lasting qualities of Tin Plate made from soft steel as compared with the tough Charcoal Iron Black Plate which years ago was the base of the tinned or terne sheet. The following quotations now represent the market for this class of Papers, viz.: Tarred Single Ply Roofing Felt, $29 to $32 per ton; two ply, 50 to 55 cents, and three ply, 70 to 77 cents per roll, the lower prices indicating the price per carload and the higher prices less than carloads in New York or the metropolitan district. Further west there is some concession from these rates, governed partly by the question of freights and proximity of raw material to the market. Slaters' Felt under the same system of prices is from 75 to 80 cents per roll of 40 to 45 pounds each, carloads and less than carloads respectively. Rosin Sized Sheathings are quoted as follows: Light, 35 to 40 cents; Medium, 45 to 50 cents, and Heavy, 55 to 60 cents per roll of 500 square feet, in carloads and less than carloads. Deafening Felt, 9, 6 and 4½ square feet per pound, is now quoted $42 per ton, without regard to quantity.

Janesville Hay Tool Company.—Janesville Hay Tool Company, 122 Lake street, Chicago, have issued their net price-list on Hay Carriers and Track, Pulleys, &c., for the season 1902-1903. It went into effect the 1st inst. They call attention to the fact that the high cost of material has necessitated a slight advance in their product over last year, but refer to their prices as somewhat lower than those of the association.

Cordage.—Owing to the weakness of the Rope market, to which reference was made last week, some low prices were quoted on Sisal Rope, as a result of which a large amount of business was booked. The market has stiffened up, but without an advance upon previous published quotations. The regular movement of Rope is moderate, as stocks in the hands of the trade are kept low. Quotations range, on the basis of 7-16-inch and larger, from 9½ to 10 cents for Sisal and from 12½ to 13 cents for Manila Rope.

Glass.—A meeting of the Independent Glass Company was scheduled to be held at Pittsburgh the latter part of last week for the election of officers and reorganization of the combination. It is expected that another meeting of the Federation Glass Company will be held at Columbus, Ohio, next week. Until the results of these meetings are known it is impossible to decide the future of the Glass market. It is reported that at a meeting of Glass manufacturers held at Columbus last week the Independent Glass Company agreed not to start their works until October if a number of outside factories, which were getting ready to start, were prevented doing so. Over 300 pots have started, which is regarded by some as annulling this agreement. Some jobbers do not consider the present outlook for harmony as encouraging. The Jobbers' Association quotations are as follows for single and double strength Glass:

	Discount.
From store	88 and 5 %
F.o.b. factory, carload lots	89 and 5 %

Paints and Colors.—*Leads.*—The demand for prompt delivery, also for forward shipments, of White Lead in Oil shows an increase. The consumption for the fall months promises to be larger than usual. Quotations are as follows: In lots of 500 pounds or over, 6 cents per pound; in lots of less than 500 pounds, 6½ cents per pound.

Oils.—*Linseed Oil.*—Frost reports had a temporary stiffening effect upon the Oil market during the latter part of last week, particularly in regard to future deliveries. A large seed crop and the anxiety of holders of Oil to sell resulted on September 8 in a reduction of City Raw by manufacturers to 57 cents per gallon in lots of five barrels or more. Out of town brands of Raw are held at 55 cents per gallon in similar quantities. The usual 1 cent additional per gallon is charged in lots of less than five barrels. There is a fair movement of Oil in small lots, but as lower prices are anticipated, only immediate requirements are being covered.

Spirits Turpentine.—The local Turpentine market is active to a limited degree, purchases being confined to comparatively small lots. The tone of the Southern market is not particularly strong, but holders at this point are firm in their views. Quotations, according to quantity, are as follows: Southerns, 47¼ to 47¾ cents; machine made barrels, 47¾ to 48¼ cents per gallon.

WILCOX MFG. COMPANY'S CATALOGUE.

THE WILCOX MFG. COMPANY, Aurora, Ill., manufacturers of Door Hangers and Hardware Specialties, have just issued an illustrated descriptive catalogue of 112 pages showing a great variety of Door Hangers for a multitude of purposes, together with many specialties peculiar to that class of trade. In addition they illustrate Corner Irons, Rail Brackets, Mower Sharpeners, Hammock and Clothes Line Holders, Bench Stops, Foot Scrapers, Ladder Fixtures, Grindstone Fixtures, Grindstone, Hammock Couches, Wire Stretchers,

Door Holders, Lawn Sprayer, &c. Some conception of the growth of their assortment of products is afforded by the size of this catalogue, which contains 48 pages more than their catalogue issued a year ago. The company now have branches in five of the largest American cities, as well as in London, Ontario, and London, Paris and Hamburg abroad.

THE MANUFACTURER'S NEGLECT OF THE RETAILER.

THE following communication from a well-known merchant touches upon the relations in which the manufacturers stand to both the jobber and the retailer, and emphasizes the point that the makers of goods in their efforts to secure the business of the wholesale trade very frequently overlook the interests of the retail merchants and fail to meet in a reasonable way their desires and requirements in regard to the goods they are marketing. The communication is a suggestive one:

It has always been a mystery to me why manufacturers, as a class, take so little pains to inform themselves of the point of view of the retailer. Their negligence in this respect is one reason why the jobbers have controlled trade so long as they have.

My early working years were passed in and about a large factory. For many years I saw every letter that was sent out or received in the office, and I heard our business discussed from every standpoint, but at the end of eight years I knew no more about the retail prices at which our goods were sold than when I began.

Our talk was always based upon what the jobber wanted, and what he would pay, and whether our competitors were cutting under us or not.

When I left the factory and took my place in a wholesale store I found I had the trade to learn as completely as if I had never been inside a shop.

When I had a business of my own and began making semiannual visits to the factories I had frequent occasion to wonder at the supreme content and satisfaction with which the average manufacturer considered his output in every detail, and the calm and superior way in which he waved aside every suggestion of change.

We hear a good deal regarding the pig-headedness of the English manufacturer, but I am confident that every jobber whose experience covers the period of 25 years will agree with me that it was at all times much easier to secure any desired change in finish, in packing or in labels than to obtain these from our home folks.

Those whose memories are no longer than "a piece of string" can recall the labels of other days, where the figures giving number and size were so small, or were printed on such dark labels that one needed an opera glass to make them out.

One of the strongest efforts was made to have goods put up in smaller amounts, both for the convenience of the jobber in filling an order and to enable the retailer to keep his shelves in better dress.

But these are simply reminiscences. Times changed and the manufacturers, after constant prodding by the jobbers, began to learn that the retailer was to be considered when packages were made. But a pet hobby of that day that has survived to the present and showing how slow the manufacturer is to learn the wants of the retailer is the quantity he expects a retailer to buy when a quotation is asked for.

Of course the jobber is to be protected. The factory manager never for a moment forgets that. But there are many items that get onto the jobber's shelf with great slowness. The wide awake retailer has seen them, or heard of them, and would put a few in stock. He learn the maker's name and writes for prices, and he is told that if he will order a quantity that is fully ten times what any retailer would be justified in buying he can get them for a reasonable price. He drops the matter right there, and with a feeling of contempt for the man and his goods.

The manufacturer has very little conception of the conditions surrounding the retail trade, and he cannot be induced to post himself in the only proper way—by making frequent visits to them.

If I were running a factory, even though all my production was taken by wholesalers, I would want to be in close touch with the retail trade, and if I found a section where the majority seemed to prefer my competitors' goods to mine I'd want to know the reason why.

The Iron Age made mention not long ago of the fact that nearly every successful jobber had worked up from a retail store. This is just why the jobbing trade keeps its hold on the retailer.

Most of us have not only been retailers, but there are very few of us who are not retailers to-day. The jobbing houses that do not retail in their main building, or in a special retail store in their own city, are very few. They know the exact argument that must be used with the consumer, and their men are able to give points to every retailer on their routes.

A shrewd manufacturer would know his trade just as thoroughly. When Henry Disston began the Saw business this was just what he did with his Saws. He followed them into the hands of the retailer and even into the carpenter shop. He did for his Saws in ten years what would have taken other men a lifetime.

I realize that the trend of the times is closer connection between the retailer and the manufacturer, but I also know that very few manufacturers would know how to handle the trade if it came to them.

THE BRONSON & TOWNSEND COMPANY.

THE BRONSON & TOWNSEND COMPANY, New Haven, Conn., have recently purchased the stock and good will of the Buckingham Hardware Company of that city and will retain the services of W. W. Buckingham. This is another important step in the growth of the Bronson & Townsend Company, whose business has been increasing rapidly since 1898, when the company were organized by Walter W. Bronson and John W. Townsend, who purchased the stock and fixtures of the Bradley, Dann & Carrington Company, with which concern both gentlemen had been closely identified for many years. Messrs. Bronson and Townsend, as well as William A. Watts, who later became associated with them, are well and favorably known as experienced and capable merchants, and their success has doubtless been due to their close attention to business and their readiness to adopt modern methods in conducting it. The company's officers are as follows: Walter W. Bronson, president; Wm. A. Watts, vice-president, and John W. Townsend, secretary and treasurer. Six traveling salesmen are employed to look after the company's constantly expanding trade.

BUTLER BROTHERS' FALL CATALOGUE.

BUTLER BROS., 495 and 497 Broadway, New York, with Chicago and St. Louis branches, have just issued their complete illustrated catalogue for the fall of 1902. This catalogue has nearly 500 pages, each 9½ x 13½ inches, of compact matter, and is referred to by them as their only salesman, but they emphasize the fact that they sell only the trade. The goods described and priced are very wide in scope. In it will be found Hardware, House Furnishing Goods, Cooking Utensils, Refrigerators, Cutlery, Tinware, China Ware, Musical Instruments, Trunks, Leather Goods, Sewing Machines, Pictures, Jewelry, Notions, Garden Implements, Rifles Revolvers, Fishing Tackle, Clocks, Sporting Goods, Books, Lamps and a large variety of other similar products. The actual selling prices are printed in plain figures in connection with each item. There is also much interesting matter explaining the method in which their business is conducted, with many practical suggestions for retail merchants in rgeard to the buying of goods. The extent of the business of the firm is indicated in the figures given as to their aggregate sales, as well as in illustrations of their stores and warehouses.

E. E. Wills has succeeded L. W. Snider & Son, dealers in Hardware, Stoves, &c., Exeter, Neb.

SAMPLING GOODS.

FIG. 1 of the accompanying illustrations shows a section of shelving in the Hardware Supply Company's store at Laramie, Wyo., of which George W. Fox is manager. The shelves are 18 inches deep, with uprights 15 inches apart, making spaces for swinging doors to cover the entire shelving. The doors of the two lower rows are 15 inches wide and 20 inches high, while the upper row is 15 x 14 inches in size, all made of ¾-inch seasoned boards. The doors are hung to the upright strips and close against the shelves, all swinging from left to right. They are finished with three ¼-inch beads on the sides and strips faced with the same are nailed on the ends. The space inside the beads is papered with maroon colored glazed paper, which is referred to as making the whole look as rich as a morocco bound book. A shutter knob is used on each door to open it, and no catches are required as the doors will stay closed without them if properly hung. They are painted a canary color on the back, so that when they are open there is a contrast in color between the maroon and the canary. Horizontal boards divide the openings between the larger doors into three shelf spaces and behind the smaller doors into two shelf spaces. The shelving is shown in detail in Fig. 2. The doors being of ¾-inch stuff give an opportunity of placing samples on them of many designs and as artistically as could be done on walls. Nos. 112 and 114 bright screw hooks are largely used for securing the samples on the doors, each sample being put on so it can be lifted off for sale and be replaced by a bright one. Goods are kept in the original boxes on the shelves, and in most cases the prices are marked on the boxes. As the company have some jobbing and contractors' trade this plan is not always desirable. In such instances tin strips as slides are fastened to the back of the door for holding a price card, which is nearly the same in color as the door and is therefore not conspicuous when the door is open. The shelving is referred to as being cheaply constructed and very convenient in use. Obviously the same arrangement can be carried out with expensive finish and mouldings, but, it is remarked, the display of goods artistically sampled is the main attraction. The company find advantages in this system over any they have tried, as the goods are behind the sampled doors free from dust, and if a box becomes broken it is not necessary to spend time tying it up, as it is out of sight. The doors swing without friction and the samples have continually the appearance of a new stock of goods, as the samples are sold and replaced from stock. The plan of selling the samples is alluded to as saving hundreds of dollars in sample, which would if permanently attached to boxes become soiled and depreciate in value.

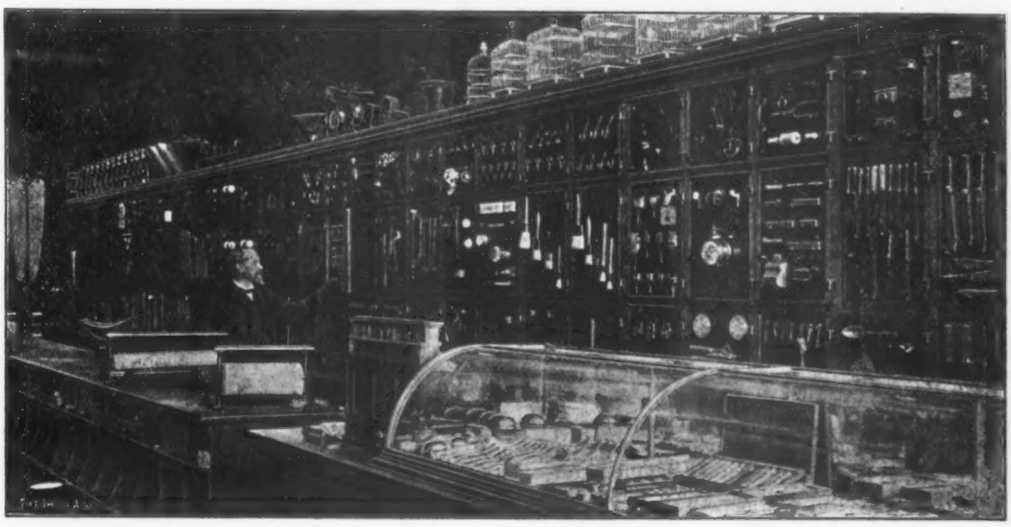


Fig. 1.—Sampling Goods.

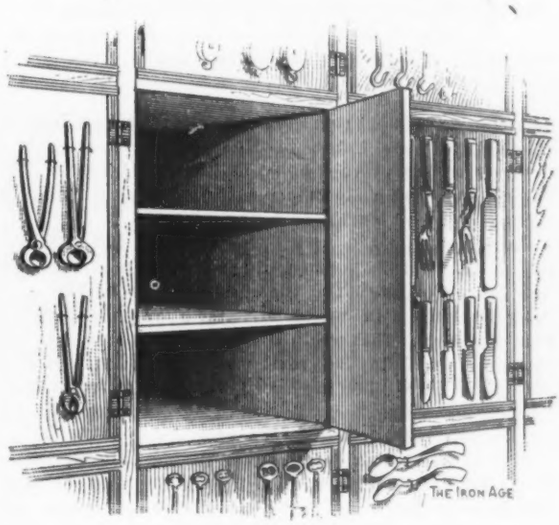


Fig. 2.—Shelving in Detail.

PURCHASE OF A PADLOCK PLANT.

S. R. SLAYMAKER, Lancaster, Pa., for whom John H. Graham & Co., 113 Chambers street, New York, are general sales agents, has recently purchased all that part of the plant of the W. H. Chapman Company, Middletown, Conn., which concerns the manufacture of Padlocks. This purchase covers all materials, finished goods and material in process of manufacture, patterns, dies, tools, trade-lists, good will, &c. The line includes a complete assortment of wrought Padlocks, covering 42 different numbers, together with a number of novelty Padlocks, some of which were not yet on the market, supplemented by a good variety of pressed steel Locks and some cast Locks quite generally sold. The entire outfit now in Lancaster will be installed in the factory buildings of S. R. Slaymaker, some of which have been built for the purpose. It is designed to make deliveries of wrought Padlocks and pressed steel Locks of this additional line in a month or so. This transaction in no way involves the manufacture of Saddlery Goods which the W. H. Chapman Company still continue at Middletown, Conn.

Wagner Bros., Odessa, Mo., have disposed of the Hardware and Stove business, which they have conducted for the past 19 years, to Cable & Ferguson, who continue at the old stand.

P. A. Williams has succeeded Williams & Bennett in the Hardware business in Strawberry Point, Iowa.

Letters From the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Features of the Business Situation.

The following careful review of the situation is of especial interest as coming from a correspondent in Ohio who is not only a successful merchant but a student of trade conditions and tendencies:

The caution drilled into the public by the panic of a few years ago still influences buying. But the times are good and buying is on the increase.

Stocks are kept up and rather full; a failure to do so means loss of trade. Life is too strenuous now for a customer to wait until you order what he wants.

The most successful merchant now is the one who has the goods in stock and the price right. Yet the price does not always govern. Quality is more looked after than it was. Better goods are being demanded.

There is an unusual degree of prosperity among all classes. This is proven by the numberless little changes and improvements that owners are making in their properties. A little painting, a little addition to the house, a little change in the arrangements to add more comforts to the home are some of the ways that the added income (arising from steady work) is being used. There is an abundance of work for those who want to work. With us there is a very strong effort to unionize labor, with a tendency to make demand for equal payment for all kinds of capacities, skilled and unskilled alike. There seems to be an inability on the part of organizers to see that the demand for wages because of union membership and not because of skill is the planting of the seed of internal dissention that will ripen ultimately into disaster and defeat. Farmers have never been in better condition. There are hardly any sales of land by foreclosure of mortgage. Banks are full of the money left by farmers. They are paying largely by check for goods they buy. The continued prosperity of the iron interests and the future outlook is so good that money is seeking investments in permanent improvements wherever possible. Building and loan companies have a demand from many who are seeking to make homes for themselves by paying per month on their property about what the rent would be. How long these times will last does not concern us. We are too busy to be pessimistic.

Enterprise of Catalogue Houses.

From a Hardware Merchant in Illinois: A prominent catalogue and mail order house have put in a branch store at our county seat, which has affected some branches of the Hardware business very much, and think it will be worse next year after they get a start.

Builders' Hardware.

From a Kentucky Merchant: Some of our jobbers are persistently figuring with contractors and builders for their Builders' Hardware, which takes away much of the retailers' just and legitimate profits. The retailers are compelled to take many small orders (and large ones, too) at almost cost, in consequence of this grasping and illegitimate policy by the jobbers.

Special Brands.

A Prominent Hardware Merchant in the West: Special brands are handled by jobbers on two different theories. One class of jobbers use a special brand to obtain the price of a first-class article for second-class goods. A few jobbers, on the other hand, have been striving to honestly gain a good reputation for their special brands by using their own brands on first-class goods only. It would seem to me that the action of the manufacturers of Axes would help this latter class of jobbers, while, of course, it would work against the former. We approve of the action of the manufacturers in this respect.

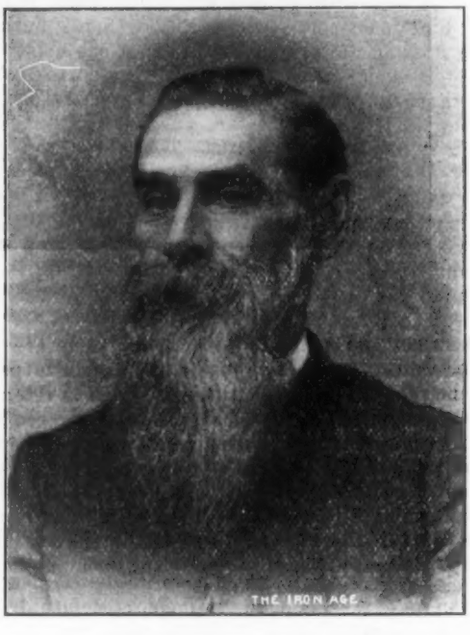
Special Brands and Quantity Discounts.

A Merchant in Missouri writes: I am opposed to private marks on Hardware. Let the manufacturer abolish quantity price, but recognize two classes of customers, wholesaler and retailer, and adjust his prices accordingly. Then there will be some hope that the Hardware trade will continue to exist.

DEATH OF H. H. ABBE.

HORATIO H. ABBE, president of the Gong Bell Mfg. Company, East Hampton, Conn., died at that place Friday, August 29, after an illness of over a year, he having given up active work in January, 1901, although his ailment did not reach its acute stage until about two weeks before his death.

Mr. Abbe was a native of Enfield, Conn., he being the youngest of a family of ten children of which all were boys but two, the sole survivor now being Harlow Abbe,



HORATIO HAMILTON ABBE.

a brother, who is 89 years old. He was married January 26, 1853, to Miss Laura A. Hayes. After engaging in business with a brother he went to East Hampton July 31, 1862, beginning his business life there as a machinist in the employ of Markham & Strong.

January 1, 1866, he, with E. C. Barton, Ezra G. Cone and A. H. Conklin, formed the partnership of the Gong Bell Mfg. Company for the manufacture of the Abbe Gong Door Bell, of which Mr. Abbe was the inventor. This business relationship continued harmoniously and without a break for 33 years, or until the death of Ezra G. Cone, in 1898, when a joint stock company were incorporated, of which Mr. Abbe became the president and Mr. Conklin secretary and treasurer.

Mr. Abbe was widely known in Masonic circles, of which he was a thirty-second degree member, he being prominently connected with a number of lodges and commanderies. The funeral services were held at his late residence, the interment being at Enfield, Conn.

Mr. Abbe is mourned by those who were intimately associated with him as an honored citizen and one whose generosity, loyalty and genial ways endeared him to a large circle of friends and acquaintances. Mr. Abbe is survived by a widow.

The store of the Kimmons Hardware Company, Alvin, Texas, was recently burned out.

NOTES ON FOREIGN TRADE.

BRITISH LETTER.

Office of *The Iron Age*, HASTINGS HOUSE, NORFOLK ST., LONDON, W. C.

The Week's Hardware Trade.

WE are still in the trade doldrums—that is to say, the summer trade from the wholesale point of view is dead, and the winter trade has not as yet much vitality. The summer has been unsatisfactory, both from the point of view of weather and of business. There has been a slight improvement during the last few days, and in consequence a number of orders have come in from travelers from seaside resorts. The demand for Tubes continues good, and a good volume of Screws, Rivets, Nuts and Bolts is going out of the shops, but at prices which are by no means remunerative. The makers of Brass Cocks, Taps, Hydrants, &c., are busy, and there is a good demand for Siphons, Cisterns and Sanitary Fittings generally. The demand for Carriage and Shop Lamps, to which I have referred in previous weeks, still continues, and autumn orders are coming in for Chandeliers and Gas Fittings generally. The same remark applies to Fenders, Fire Brasses, &c. Some business is being done in Metallic Bedsteads, but the export department is slack. There is a brisk demand in Hollow Ware branches for Kettles and Saucepans, and makers of Galvanized Hollow Ware are busy on Boiler Fillers, Tanks and Sanitary Apparatus. There has been considerable slackness in all export departments; some importing countries are a little better or a little worse than the others, but the general average during the past week has been low. South America is waking up a trifle, and some orders have been received from Japan, China and other Eastern countries. During the past few weeks some good orders have been received from America for special qualities of Cutlery, but in medium and common goods enormous quantities of which were at one time sent to America, there is now nothing doing. The experience of Sheffield firms is that if they put upon the market a specialty of exceptional value they can sell it in America, but the margin of profit is necessarily restricted and the total quantity sold can never be great. In the Cutlery trade here is a hint for some enterprising American exporter. A Sheffield firm has the reputation for Butchers' Cutlery. They have this week received a communication from a customer in New Zealand, in which he says he supplies the slaughter men in two large meat preserving and export factories with the Knives they require. Each factory during the season kills 4000 sheep per day, and the number is increasing, and with it the demand for Knives, Steels and so on. Makers of such Cutlery, as well as of Bowie Knives and other high class goods look with some apprehension to the future on account of the growing scarcity of skilled workmen, especially of forgers. One Sheffield manufacturer says: "I do not know what will become of the trade unless there is a change and more labor can be introduced." It appears that the older skilled workmen are dying off, and there are no young ones coming forward to take their places. What becomes of them? Are any of them to be found in American factories?

The New Parcels Post Arrangements.

Journalism has been described as an intelligent anticipation of events yet to happen. If so, I may write myself down a journalist, for only last week I was commenting upon the necessity for new arrangements with regard to the parcels post in the United States, and hey, presto! three days later comes an official announcement from the Post Office that such arrangements have been made. For the guidance of American houses who have connections in England I append herewith the actual arrangements:

1. On and after September 1 parcels will be accepted at any post office in the United Kingdom for transmission to the United States.

2. This service has been established in co-operation with the American Express Company, a private company of carriers; and the United States Post Office is not concerned in it.

3. The conveyance in this country will be performed by the British Post Office. The parcels will be conveyed across the Atlantic by packets of the Cunard and White Star lines, under contract with the Postmaster-General. For the conveyance in the United States the American Express Company is responsible.

4. The postage charges (i.e., the charges for conveyance in this country and the United States and for the Atlantic transport) are as follows:

On parcels—	Not over 3 lbs. s. d.	From 3 lbs. to 7 lbs. s. d.	From 7 lbs. to 11 lbs. s. d.
(a) For New York City, Brooklyn, Jersey City or Hoboken	1 0	2 0	3 0
(b) For any other part of the United States	2 0	3 0	4 0

A charge for the clearance of parcels through the United States Customs will be made at the rate of 1 shilling each. This sum, together with an additional charge of 1 shilling levied by the United States Government under the title "Sample Office fee" or "Storage fee" on every parcel entering the country, may be prepaid or left to be collected from the addressee. Customs duty at the ordinary tariff of the United States will also be charged.

5. The limits of size and weight will be those of the inland parcel post.

6. Parcels will be accepted for transmission to the British Post Office at any office of the American Express Company in the United States.

The Lock Trade.

In my comments last week upon the disturabnce in the Lock trade I stated on the authority of the employers that the wages for skilled workmen were 40 shillings a week. It is only fair to state that these facts are disputed by the men, who contend that many skilled workmen in the Lock trade only earn 20 to 24 shillings per week. I am afraid it must be admitted that the average wages in the Willenhall Lock trade are so low as to preclude the best efficiency.

The Syllabus.

Some time ago I reported that the Ironmongers' Federated Association of this country was seriously taking in hand some system whereby ironmongery clerks could pass an examination and obtain a certificate. The gentlemen concerned are not letting the grass grow under their feet, and already the proposed syllabus has been evolved. As it is full of suggestive matter I give it *in extenso*. Those with an asterisk opposite the number will be considered optional subjects:

1.—Standards of Weights and Measures and their usual divisions.
*2.—Standards of Metric Weights and Measures and their usual divisions.
3.—Gauges in common use for Wire and Tube.
4.—Calculation of Areas.
*5.—Calculation of Cubic Capacities.
*6.—The Physical Characteristics of Metals and Alloys. Definition of ductility, malleability, elasticity and tensile strength.
*7.—Oxidization or Rusting. The particular properties of Iron (wrought, malleable, cast and steel), Copper, Tin, Lead, Zinc, Gun Metal, Phosphor Bronze, Pewter, Brass, Nickel Silver, Britannia Metal and Aluminum.
8.—Methods of Preserving from Oxidization.—Painting, lacquering, bronzing, plating, tinning and galvanizing.
9.—Hardening and Tempering of Metals.
10.—Methods of Jointing Metals. Welding, brazing, soldering and riveting.
*11.—Relative Electrical Conductivity of Metals.
*12.—Gas Fitting. Sizes of pipes for installation of a given number of lights. Choice of metals for special situations.
*13.—Sanitary Plumbing. Forms of traps, closets and lavatory basins. Sizes of waste pipes. Joints used, for lead and iron pipes in sanitary work.
14.—Domestic Hot Water Supply.
*14a.—Heating by Hot Water. High and low pressure.
15.—Locks. The general principles of construction and various kinds in common use of Locks, Lock Furniture and Hinges.
*16.—Bells—Electrical and Crank. The principles of the telephone and speaking tube.
17.—Builders' Black and Brass Foundry. Knowledge of usual stock articles. The candidate will be required to draw out specifications and make sketches.
18.—Nails, Locks, Bolts and Nuts, Screws and Rivets, various kinds and their common uses.
*19.—Tools, trade classification as Sheffield list; and Cutlery, pocket and table.
20.—Hollow Ware. Cast, wrought, stamped, enameled, tinned and galvanized.
*21.—Scales, Weights, Spring Balances. The requirements of the Weights and Measures Acts.
*22.—Wire and Wire Goods.
*23.—Rain Water Goods. Pipes, Gutters and Fittings.
*24.—Kitchen Ranges.
*25.—Stove Grates.

*26.—Planning Glazed and Unglazed Tiles.
*27.—Agricultural Implements. Plows, Harrows, Drills, Mowers, Reapers, &c.
28.—Steam, Gas and Water Tubes and Fittings.
29.—Making Drawings and Instructions for Workshop.
30.—Handwriting, Orthography and Calculation of Discounts; also Bookkeeping.
*31.—Lamps. Structure, materials and appliances for safety of petroleum Lamps: Colza and other heavy oil Lamps.
32.—Woodturnery. Builders' and house furnishing.
*33.—Colliery and Mill Furnishing.
34.—Ship Chandlery.

Examinations will be held every six months in the principal centers, viz.: Birmingham, Bristol, London, Manchester and Newcastle. The examination committee may decline to hold an examination if less than 10 applications are received by the secretary. Ninety per cent. of total possible marks entitle the candidate to a first-class certificate with honors; 75 per cent. of total possible marks to a first-class certificate; 50 per cent. to a second-class pass. There are other regulations, but these are the chief.

Wanted, a Lamp.

Can any American manufacturer give us a lamp which will not explode with a low flash oil? If so, he can make his fortune in this country. In the report just issued by the Chief Officer of the Public Control Department of the London County Council, the number of lamp accidents investigated by the Council's inspectors during the past year was exactly the same as in the previous year, 204, while the number of fatal accidents dropped to 18, the smallest number recorded for several years past. These 18 fatal cases resulted in the loss of 21 lives. From July, 1890, to March 31 last 2463 accidents occurred, involving the loss of 323 lives, in the County of London. It was pointed out that the fatal cases in 1895-6 numbered 44, as compared with 18 of last year, and upon this the Chief Officer remarks:

It is difficult to ascertain to what causes the improvement can be attributed, but it may have been partly due to the increased use of high flash Oil, partly to improvement in Lamps, and partly to increased carefulness. It is to be regretted, however, that this improvement has not been maintained since the period dealt with in the returns, as no fewer than 11 deaths have occurred between April 19 and 30, 1902, as the result of three petroleum Lamp accidents. In each of the three cases low flash Oil was used in the Lamp, and after a thorough investigation made by the Council's officers there appears to be no doubt that the special danger arising from the use of low flash oil was present in each case. . . . The further experience gained year by year from the investigation of Lamp accidents in London confirms the view that a remedy for the great majority of petroleum Lamp accidents would be found in raising the flash point, and that to deal with the evil solely by means of improvements in Lamps will not be effectual. . . . Raising the flash point would have the immediate effect of keeping low flash Oil out of the country, while it would in no way affect the importation of petroleum spirit, which is largely used in the manufactures and in Motor Cars.

As a matter of fact, however, it is next to impossible to keep a low flash oil off the market. Attempts have been made to legislate it out of existence, but they have not proved very successful. The people in London who use Lamps are semipoverty stricken, with the exception of a smattering of well to do people who like the Oil Lamp for the sake of the warmth of its light. Their poverty and not their will, therefore, compels them to buy, first, cheap Lamps, and, secondly, cheap oil. But the cheap oil is low flash. If, therefore, they can get a cheap Lamp which will, without danger, enable them to buy cheap oil, the sale for such a Lamp is practically unlimited.

A Fruit and Vegetable Rack.

It is not my business as a general rule to concern myself with much outside the export trade, but like everybody else, I like to see a new idea taken hold of. There has just been put upon this market a Fruit and Vegetable Rack which it seems to me American wire work manufacturers might, with advantage, imitate. We all know how difficult it is to store vegetables, even for 24 hours. They must have ventilation, they must be easily arranged, and to achieve this purpose a galvanized wire Vegetable Rack has been devised and is now selling in the English market. It is ¾-inch mesh diamond wire work, and is mounted on strong wrought iron feet, measuring about 2 feet 10 inches in hight by 1 foot 8 inches in width, while it is about 9 inches through from front to back. It has three pockets, each capable of holding quantities of vegetables, fruit, &c., and is arranged to permit the free access of air to every part. The makers contend that by this Rack fruit and vegetables may be kept perfectly fresh and sweet for a longer period than usual, while its compactness and the fact that it can be hung on the wall or placed out of the way of the larder or scullery are all points in its favor.

Trying to Capture Canadian Trade.

Mr. Macfee of the Montreal Board of Trade has recently been on a visit to Birmingham, where he met in private conference the leading members of the Birmingham Chamber of Commerce. Views were freely exchanged as to the possibilities of greater development of trade between Birmingham and Canada. It was pointed out to Mr. Macfee that the export trade of Birmingham and district with Canada is very small, with a tendency further to decrease. Mr. Macfee emphasized the desire of the Canadian people to develop both their export and import trade with Great Britain in preference to the United States of America, and expressed the opinion that if the projected Fifth Congress of Chambers of Congress of the Empire were held at Montreal next year the visit of large numbers of British manufacturers and merchants to the Congress would materially assist such development. The Birmingham Chamber of Commerce concurred in this view, and expressed the intention of appointing one or more delegates to represent the Chamber at the Congress, if convened. I wonder if the Fifth Congress of Chambers of Commerce of the Empire will endeavor to modify in some degree the law of gravitation.

The Philippine Trade

The annual report of the trade of the Philippine Islands for the year 1901 is just to hand. By way of showing American exporters that they have yet a long row to hoe here are a few facts gleaned from this report:

In 1901 out of a total of imports, valued at $32,758,095, gold, $15,545,734 worth came from various British or Colonial ports. These paid $3,183,055 duty out of a total of $6,394,915. Imports have increased from $24,284,666 in 1900 to $32,758,095 in 1901. This increase is mainly due to a much increased civil population, whose food, drink and clothes all have to be imported. Cooking Stoves are in increased demand to replace the primitive native arrangement hitherto in vogue. Automobiles are being imported from the United States of America, owing to the high price of ponies. A light machine suitable for use in the town and not too expensive would sell well here at present. Of the total value of imports the following table shows the trend of the trade as between the chief countries of Europe and America:

	Value.	Duty.
Austria-Hungary	$114,052	$23,051
Belgium	219,834	55,882
British Australasia	530,611	56,092
British China	201,754	18,960
British Columbia	22,684	1,756
Chinese Empire	2,674,451	687,994
British East Indies	3,692,011	661,482
Dutch East Indies	271,305	50,966
French East Indies	1,859,925	383,871
England	4,471,878	1,257,944
France	1,882,221	235,692
Germany	2,030,297	415,475
Hong Kong	5,966,412	39,221
Japan	920,634	324,175
Scotland	613,278	123,465
Spain	1,790,927	668,253
United States of America	3,495,135	853,749

It will be seen that as yet the trade done by America with the Philippines is proportionately exceedingly small.

The Columbus Hardware Company, Columbus, Ga., have been succeeded by the Bush Hardware Company, who will continue the wholesale and retail business in Hardware, Stoves, Tinware, Agricultural Implements and Sporting Goods. The store is a new one, and is 50 x 300 feet in dimensions, two stories high.

The Gilbert Hardware Company, Macon, Ga., closed out their business on the 1st inst.

AUSTRALIAN LETTER.

FROM A SPECIAL CORRESPONDENT.

The Endless Tariff.

YET another stage has been reached in connection with this much discussed subject, and it may be as well for the information of American merchants to briefly indicate "where we are," and to give some idea of how things are likely to eventuate as regards the metal and machinery sections. The Federal Senate has made various suggestions in the way of reduced duties. It is not in the least likely that the Lower House will accept these suggestions *in toto*, and a process of discrimination will probably be submitted to and compromises be effected in various lines.

Meantime, the Chambers of Manufacture of the various States are sending delegates to Melbourne in connection with these suggested reductions in duty, as they truthfully claim that if the reductions are given effect the results will be the closing down of various factories, the reduction of others and consequent loss of employment for local workers, as the result of increased importations from America and Europe.

The following tabulated list gives the various lines in which readers of *The Iron Age* are chiefly interested and shows how each line stands at present:

	Duty originally imposed.	As passed by House of Representatives.	As passed by Senate.
Mangles, Clothes Wringers and Washing Machines	20%	20%	10%
Agricultural, Horticultural and Viticultural Machinery and Implements	15%	15%	10%
Horseshoe Nails, per cwt	7s.	5s.	Free.
Gas Engines	20%	15%	10%
Oil Engines	Free.	15%	10%
Engines	25%	15%	10%
Boilers, Pumps, Machines and Machinery	25%	15%	10%
Mining Machinery	20%	15%	10%
Electrical Machinery	20%	15%	10%
Electrical Appliances, N. E. I	20%	15%	10%
Rails, Fish Plates, Fish Bolts, Tie Plates, &c	15%	15%	10%
Rolled Iron or Steel Beams, Girders, Joists, &c	20%	15%	10%
Galvanized Iron	10%	10%	Free.
Reapers and Binders	15%	15%	Free.
Wire Netting	10%	10%	Free.
Spelter	10%	10%	Free.
Other Machinery or parts	15%	15%	Free.

The ultimate decisions in these lines will be duly advised.

The General Outlook

of trade prospects is far from good, and your merchants must not look for an expansion of their Australian trade for some time to come. Rather is there likely to be a shrinkage. Judging from present appearances, the most acute stage of the present depression will not be reached for about 12 months to come. The reason for this statement is the fact that, so far, the actual effects of our present prolonged drought have not been closely brought home to us. Heavy losses of sheep are going on daily, and hundreds of thousands of pounds are being spent in the purchase of feed for the daily reducing number of stock. New South Wales and Queensland must go for many years before recovering from the severe blow which has robbed them of about 60 per cent. of their sheep. The former State has lost 40,000,000 of its 77,000,000 sheep, and the ultimate effects must be far reaching. Capital has actually vanished, and how is it to be replaced? And not only is it the wool growing which has suffered, but as a consequence of drought, cattle breeding, dairying, farming, freezing and even mining industries have all been badly hit, so that the finances of the private individual, the community and the State have all suffered alike, and even with fresh capital some considerable time must elapse before normal output can again be attained.

Even our hardy nuisance, the rabbit, has been temporarily eradicated in many parts. As previously pointed out, the State of Victoria has suffered least of all, due to its geographical position. Out of evil good may possibly come, and no doubt when we have tided over our present troubles a large and hitherto almost untouched industry will arise. This industry will be the art of irrigation and water conservation, and will open up new requirements in Machinery and Implements.

South Africa has been looked to of late as likely to afford a market for Australian produce at the conclusion of the war, but here again we have been handicapped as regards exports of our natural products by the restrictions of the drought, while in our manufactures we can scarcely hope to compete with the American article, aided by the low rates of freight from New York to the Cape.

New Zealand.

The colony of New Zealand (not included in the Commonwealth) is passing through a time of much prosperity and is actively pushing its trade relations with other countries. A line of steamers is being started for the New Zealand-South African trade. Railway development, building and public works are proceeding steadily and travelers speak of New Zealand as the only place where they can book decent orders. Tenders will shortly be called in London for an electric tramway service for Wellington, and American electrical engineers should get particulars from the New Zealand Agent-General's office in London.

Ammunition Contract.

The Colonial Ammunition Company of Melbourne have received an order from the Commonwealth Defense Department for the supply of 10,000,000 rounds of .303 Rifle Ammunition, of which 9,500,000 rounds will be ball cartridge and 500,000 blank, to be delivered half the quantity by the end of the present year and balance by June 30, 1903. The Federal Commonwealth states that the annual supply will shortly have to be increased to 17,000,000 rounds. The above is, of course, a purely Government contract, but, apropos "Shooting Irons" of all sorts, it may be as well to mention that shooting is one of our great national sports and the field for Sporting Rifles in Australia is a good one. Good English makes sell well, but are high priced as a rule. American makes are not nearly so well represented as they might be and there is ample room for a good medium class trade if the article was well advertised, worthy of merit and would retail at 7 or 8 guineas.

Trade Combines

are not to be tolerated in New Zealand. This country, which always leads the way in experimental legislation, now has a bill under consideration forbidding, under penalty, the regulation of trade prices and restricting dividends to 15 per cent. per annum. A further bill providing for taxation of commercial travelers is also under discussion. Some few years ago a toll of £50 was imposed on all commercials entering the colony, but after being operative for some time was withdrawn, as the result of combined agitation.

A Land of Agents.

A. L. Silverstein's (New York Cutlery house) traveler paid a flying visit to Australia and left on the return trip August 4, after a brief stay of six or seven weeks. A few other American and English agents have put in an appearance to cater for our (at present) not increasing wants. This is a land of agents, their name is legion, and really it is difficult to understand how many of them contrive to exist.

The Vordenbaumen-Eastham Company, Limited, Shreveport, La., have been incorporated with an authorized capital of $300,000, of which $100,000 has been paid in. The parties interested are E. H. Vordenbaumen, Jno. H. Eastham, W. N. Stroud, Geo. A. Stroud, Jno. R. Jones and A. F. Deckman. The officers are Mr. Vordenbaumen, president; Mr. Eastham, vice-president, and W. N. Stroud, secretary and treasurer. The company will continue the wholesale and retail business in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, Crockery, Glass Ware, Wagons and Buggies, Mill Supplies, &c. They are erecting a new brick and stone building on ground recently purchased by them. The building will be 40 x 150 feet, five stories and basement.

WILLIAM A. ROGERS' NEW CATALOGUE.

WILLIAM A. ROGERS, LIMITED, 12 Warren street, New York, have reecntly added to their group of illustrated catalogues showing the many kinds of Silver Plated Ware they make three books numbered 26, 27 and 28. No. 26 relates solely to Soda Fountain Supplies such as Crushed Fruit Bowls, Chocolate Pots, Bowls, Pitchers, Mugs, Skeleton Soda Holders, Strainers, Soda Spoons, Ladles, &c. No. 27 covers a general line of Silver Plated Hollow Ware for regular household purposes. No. 28 contains 48 pages and is artistically gotten up, the half-tone engravings being a third, quarter and fifth sizes, according to the character of the ware. This line covers their best quadruple plated Hollow Ware on a base of hard white metal of the first quality. In several catalogues of earlier issue they show very complete lines of high grade Silver Plated Flat Table Ware, as Knives, Forks and Spoons, Cutlery, &c., while one catalogue illustrates and describes an inexpensive line suitable for more general use and premium purposes. This concern operate factories at Niagara Falls, N. Y., Northampton and New Bedford, Mass., and Oneida, N. Y. Still another catalogue, in course of preparation, will be issued later in the fall.

JOHN PRITZLAFF HARDWARE COMPANY.

THE JOHN PRITZLAFF HARDWARE COMPANY, Milwaukee, Wis., the business of which company was founded in 1850 and incorporated in 1884, have just issued a very complete and comprehensive catalogue. The volume is 10 x 13 inches and contains 1318 pages. It is substantially bound in leather with strong board covers, is printed on a good quality of paper and profusely illustrated. The frontispiece is a steel engraving of John Pritzlaff. Immediately following the title page are two large half tones showing two elevations and a bird's eye view of the company's extensive establishment. The book is provided with a comprehensive index for ready reference. The catalogue is divided into nine departments. The first is devoted to Mechanics' and Edge Tools, the second to Farming Implements and Miscellaneous Hardware, the third to Locks, Latches and Builders' Hardware; the fourth to House Furnishing Goods, Scales, Refrigerators, &c.; the fifth to Pocket and Table Cutlery, Razors, Scissors, &c.; the sixth to Venetian, Royal Enameled, Japanned, Galvanized, Pieced and Stamped Tinware, Tin Plate, Metals, Tinners' Stock and Tools; the seventh to Iron, Steel, Bolts and Blacksmiths' Hardware; the eighth to Guns, Revolvers, Ammunition, Canvas and Leather Goods; the ninth to Fishing Tackle, &c.

THE WHITE MOUNTAIN FREEZER COMPANY.

THE WHITE MOUNTAIN FREEZER COMPANY, Nashua, N. H., are making extensive improvements in and additions to their plant. During the past few weeks they have completed a new foundry to take the place of the one burned in July of last year. The building, which is of brick and steel, with slate roof, is 200 feet long by 50 feet wide, with all necessary rooms for tumbling and snagging castings, storage, &c. The foundry is equipped with a 64-inch Colliau cupola, and a No. 5 Root's blower of latest pattern. An addition to their brick tin shop building of 40 x 100 feet, three stories, has just been completed which will double the capacity of this department of the works. The company also have plans drawn for a new brick galvanizing and tinning building, 30 x 100 feet, with all latest equipments, and state that this building will be completed and in commission before October 1. With these additions to their already extensive plant, the company claim their capacity will be increased about 50 per cent, so they will have no trouble in producing a sufficient quantity of freezers of their well-known brands to supply the trade promptly at all times.

Chas. Schuber has purchased the Hardware and Tinware business of C. M. McMurray & Co., Geraldine, Texas. Mr. Schuber buys and sells for cash.

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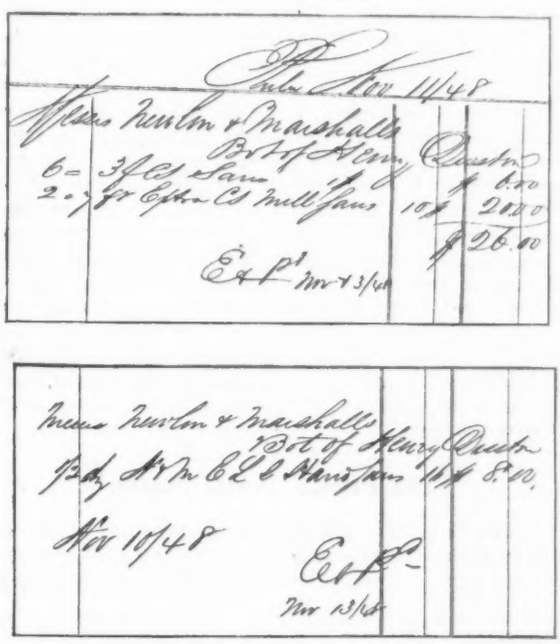
SHIP CARPENTERS' AND OTHER SAWS.

OUR attention has been called to the mistaken impression which prevails to a certain extent in the trade that the narrow pattern of Hand Saws, especially intended for ship carpenters' use, is a new article. Saws of this pattern, however, have long been made by Henry Disston & Sons and by other Saw manufacturers in the country. In connection with this matter the interesting fact is stated that Henry Disston, the founder of the business of Henry Disston & Sons, was one of the first advocates of this particular pattern of Saw for the use of ship carpenters. We have been shown an old catalogue issued by him in 1855. On page 7 of this catalogue a letter appears from A. McDonald, who was at that time a popular Hardware merchant in the shipbuilding section of Philadelphia. He refers to the fact that he had for the past seven years been selling Henry Disston's Saws for ship carpenters, ship joiners and other mechanics, and after alluding in strong terms to their quality he refers directly to the narrow pattern



Hand Saw, or "Ship Carpenters' Saw," as it is generally known. The Saws have in fact been made by the Disston works ever since the business was established.

In connection with this general question we present herewith *fac-similes* of two autograph bills for goods sold by Henry Disston in 1848 to Newlin & Marshall, Hardware jobbers, of Philadelphia. The two 7-foot extra cast steel Mill Saws here invoiced at $10 each net are now sold at a price enabling the trade to sell again to the consumer of these goods for about $5.75 each net. This will serve to illustrate the reduction in selling price on goods now handled by the Saw trade, as well as many other articles in the Hardware line.

TRADE ITEMS.

LANDON P. SMITH, president of the Smith & Hemenway Company, 296 Broadway, New York, sailed Wednesday, September 9, on the steamer "Graf Waldersee" of the Hamburg-American Line for Europe. The trip is purely a business one in the interest of the company of which he is the head. He will visit the trade in Great Britain and on the Continent, returning to New York about the end of October.

SPEER HARDWARE COMPANY, Fort Smith, Ark., are at work on a new general Hardware catalogue which they expect to issue in the near future. It will be an especially large volume, comprising about 1500 pages.

FRANCES BANNERMAN, dealer in Ordnance, War Relics and Military Goods, with office and salesroom at 579 Broadway, New York, has purchased Polopel Island, on the Hudson River, opposite Cornwall, N. Y., for storing his Ammunition and some of his other goods. His Cannon warehouse is at 1556-1562 Bergen street, Brooklyn, N. Y.

GEO. HOOD, who has charge of the Builders' Hardware department of Baker & Hamilton Company, San Francisco, Cal., was a recent visitor to the trade in Chicago. Mr. Hood is on his way East and expects to spend a week or ten days in New York City.

E. BISSELL & Co., wholesale auctioneers, 12 Murray street and 15 Park place, New York, announce an important trade sale of Enameled Ware on September 17, 18 and 19 at their warerooms. The sale is by order of Lalance & Grosjean Mfg. Company and National Enameling & Stamping Company, and will comprise over 12,000 cases of goods from the factories of these concerns. The goods will be sold by the case in quantities to suit the jobbing and retail trade.

PRICE-LISTS, CIRCULARS, &c.

THE CHAMPION TOOL COMPANY, Conneaut Lake, Pa.: Illustrated catalogue and price-list No. 53, relating to Blacksmiths' and Horseshoers' Tools, including Horseshoers' Vises, Bolt Clippers, Hammers, Hoof Parers, Pincers, Tongs, Farrier's Knife, &c.

THE ROYAL MFG. COMPANY, 408 Commerce street, Philadelphia, Pa.: Catalogue No. 8, of Metal and Hardware Specialties. Among these are Fryers and Drainers, Frying Baskets, Extra Deep Hotel Fryers, Hotel Lard or Grease Pans, and Improved Henis Self Basting Broilers.

C. L. BASTIAN MFG. COMPANY, 76-82 Illinois street, Chicago, Ill.: Catalogue B of Siamese Hose Valves, Hydrant Gates, Automatic Couplings, Hose Pipes, Nozzles, &c. The company are also brass founders and finishers, and make a specialty of Castings of every description in aluminum, German silver, phosphor bronze, red and yellow brass.

SIMMONS HARDWARE COMPANY, St. Louis, Mo.: Catalogue No. 429, of Sporting Goods. This illustrates, with prices, a line of goods for fall sports. It is accompanied by a pamphlet giving special net prices on the line.

LINDSAY & Co., 170 Lake street, Chicago, Ill.: Lighting Specialties. Catalogue No. 1 illustrates Cap and Loop Mantles, Burners, Chimneys, Shades, Gas Portables, Little Wonder Lamps, &c.

THE TAYLOR PATENT FLY EXIT COMPANY, Urbana, Ohio: Folder describing the Taylor Patent Fly Exit, an attachment for Screen Doors and Windows.

F. E. KOHLER & Co., Canton, Ohio: Illustrated catalogue and price-list, September 1, 1902. The goods shown include Post Hole Diggers, Hog Ringers, Lawn and Garden Rakes, Saw Sets, Anti-Rattlers, Lawn Sprinklers, Curry Combs, &c.

JOHN E. SMITH'S SONS COMPANY, Buffalo, N. Y.: Circular illustrating Hand and Power Kraut Cutters, Power Fruit and Vegetable Slicers and Hand and Power Choppers, with self mixers, designed for chopping dried apples, nuts, meats, mincemeat, &c.

MASSACHUSETTS TOOL COMPANY, Greenfield, Mass.: Fine Precision Tools. Illustrated catalogue No. 3 is devoted to Micrometer Calipers, Gauges, Steel Rules, Keyseating Rule Blocks, Try Squares, Protractors, Calipers, Dividers, &c.

T. A. RAYMOND, Binghamton, N. Y.: Nickel Plated Hammers. An illustrated circular describes five styles of Hammers. This is accompanied by colored hangers for store use, calling attention to these goods.

THE SCOTT DRIVE WELL POINT COMPANY, 53 to 55 Fulton street, Chicago, Ill.: Illustrated circular relating to Well Points, Tubular Well Cylinders and Well Supplies. These goods, it is stated, are offered to the jobbing trade exclusively.

THE L. S. STARRETT COMPANY, Athol, Mass., and 123 Liberty street, New York: Supplement to their Catalogue No. 16, an illustrated catalogue of 28 pages, which describes a large variety of new and fine mechanical Tools of precision.

AMONG THE HARDWARE TRADE.

King & Heath have purchased the Hardware, Stove, Tinware, Agricultural Implement, Sporting Goods and Wagon and Buggy business of C. B. Crawford, Shelbsburg, Iowa.

D. Phillips & Son have lately embarked in business in La Harpe, Kan., handling Shelf Hardware, Stoves, Tinware and Sporting Goods.

Gille Hardware & Iron Company, Kansas City, Mo., have lately opened a retail department at 804 Walnut street. The new establishment is referred to as one of the finest retail stores in the country.

Manchester & Gill, Hardware, Stove, Harness, Sporting Goods and Furniture dealers, Skidmore, Mo., have been succeeded by Manchester, Gill & Dodds. They now occupy a room, 50 x 60 feet, in addition to the one occupied last year. Since moving into the new building they have added furniture and undertaking to their former business.

Meredith & Co. have purchased the Hardware stock of Cardwell & Leidigh, Nebraska City, Neb.

W. C. Sutton has sold his Hardware business in St. Edwards, Neb., to Read & Edgerton, who continue at the old stand.

F. L. Belzer has succeeded Belzer & Doss in the Hardware, Stove, Tinware, Farm Implement and Sporting Goods business in Rock Rapids, Iowa.

The Leland Hardware Company have lately commenced business in Leland, Miss. The company have been chartered with a capital of $10,000, the following being the officers: C. C. Dean, president; J. W. Thompson, vice-president, and J. A. Gary, secretary-treasurer and general manager. The line carried by the concern embraces Shelf and Heavy Hardware, Stoves, Crockery, Queens Ware, Wagons, &c.

P. F Wright & Son, Hardware, Stove and Farm Implement dealers, Wakita, O. T., have dissolved partnership, and the business is now being conducted by P. F. Wright under his own name. Mr. Wright has lately completed a new building for the accommodation of his Implement stock. It is 30 x 120 feet in dimensions.

The McCrary & Lassiter Company, dealers in Hardware, Farm Implements, Buggies, &c., Asheboro, N. C., have been succeeded by McCrary-Redding Hardware Company, who will continue the wholesale and retail business. A new store, 32 x 120 feet, three stories high, is in course of erection; also a warehouse, 32 x 100 feet in dimensions.

W. H. Rowan has disposed of his Hardware and Furniture business in Powersville, Mo., to M. L. Dinkin.

Crandall & Coon are successors to W. D. Crandall, dealer in Hardware, Stoves, Tinware, Agricultural Implements, Harness, Lime, Cement, &c., Leonardsville, N. Y.

W. H. Hay, for more than 35 years a member of the Hay Hardware Company, Oshkosh, Wis., has retired from business because of ill health. Mr. Hay has disposed of his interest in the concern to his brother, S. M. Hay, and his nephew, W. J. Hay, who will continue the business without change in style. It will be managed by S. H. Gulliford, who has been connected with it since 1871.

T. E. Murrell has been admitted to partnership in the Hardware firm of Perrow, Evans & Co., Lynchburg, Va.

R. M. Davies has sold a half interest in his Hardware, Farming Implement, Buggy, Wagon and Harness business in Alva, O. T., to C. P. Green, and the style has been changed to Davis & Green.

Buhl Sons Company, wholesale Hardware, Tinware, Sporting Goods, &c., Detroit, Mich., have incorporated with a capital of $600,000. The company advise us that their business has grown so fast during the past five years that greater facilities for its conduct are necessitated. They are accordingly erecting two more warehouses, each 30 x 200 feet in dimensions, which adjoin their present establishment. Of these they expect to take possession within a few days.

J. E. Nye, dealer in Hardware, Stoves and House Furnishing Goods, West Union, Iowa, has recently disposed of his business.

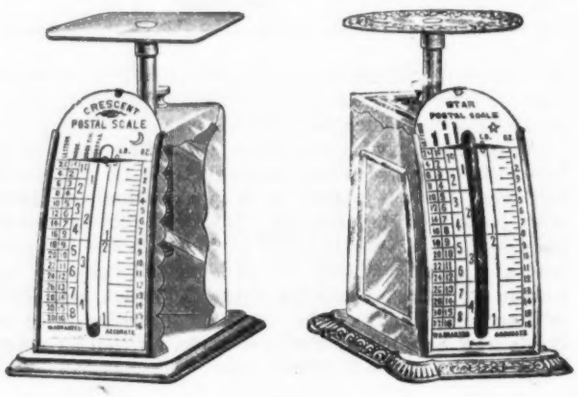
MISCELLANEOUS NOTE.

Improved Coates Clipper.

The Coates Clipper Mfg. Company, Worcester, Mass., for whom John H. Graham & Co., 113 Chambers street, New York, are sole selling agents, call attention to their latest cutter head for power horse clippers, which throws six teeth, instead of three teeth, as heretofore made by them. The company claim that this is the only cutter head throwing six teeth on the market and that no additional power is required to operate it, enabling the user to accomplish twice as much work in a given time. All parts of the head are made of hardened steel and it is said the working parts cannot get out of alignment. All of the Coates machines are furnished with patent ball and socket joint flexible shafts and ball bearing cutter heads. They are also equipped with a patent quarter turn which renders unnecessary the old style bevel gears, the improved form obviating any danger of being caught in the gears, at the same time being noiseless. We are advised that the Coates Clipper Mfg. Company have been awarded the United States Government contract for bicycle clippers, which is the fourth contract from this source in two years.

The Pelouze Postal Scales.

The Pelouze Scale & Mfg. Company, Chicago, Ill., are offering the postal scales shown in the accompanying illustrations. The Crescent scale, Fig. 1, has a capacity



The Crescent. The New Star.

The Pelouze Postal Scales.

of 1 pound by half ounces, and gives the exact cost of postage on all classes of mail matter. The index, which registers the cost of postage, starts at the top of the dial, the point being made that the person using it does not have to stoop to read. The scale is 3 inches high, 2 inches wide and 3 inches deep, taking but a small amount of space on a desk. Each scale is boxed separately, and is designed to retail at $1. The New Star scale, Fig. 2, has been improved in appearance, now being made with paneled sides and embossed base and top plate, to sell at $1.50, the same price as the old Star pattern. The company state that their holiday line will comprise several new scales in sterling silver and gun metal; also in genuine seal leather with sterling mountings.

Enterprise Sausage Stuffer, Lard and Fruit Press.

The stuffer and press illustrated herewith is referred to as having the stuffer cylinder bored true so that when

Enterprise Sausage Stuffer, Lard and Fruit Press.

stuffing the material must pass through the spout, there being no space between the edge of the plunger plate and the cylinder. The lips on the tin cylinder make handling and emptying it easy and prevent burning the hands of the operator. It is pointed out that the new patented spout furnished with each stuffer is superior to the old style, the corrugations preventing air entering the casing while stuffing, thus obviating the necessity of puncturing the casing, assuring the preservation of the sausage. The device is offered by the Enterprise Mfg. Company of Philadelphia, Pa.

Rhodes Grass Shear

The Cronk & Carrier Mfg. Company, Elmira, N. Y., are putting on the market the grass shear shown here-

Rhodes Grass Shear.

with. The handles are made long so that the shear can be used by the operator in an erect position. The shear is admirably adapted, the manufacturers remark, for trimming edges of lawns.

Butcher Knife, No. 400 Line.

Nichols Bros., Greenfield, Mass., are offering a line of butcher, skinning, sticking and boning knives, catalogued as the No. 400 line, of which the butcher knife is shown herewith. The knives are referred to as being of high grade, finely finished and ground sharp. They have polished octagon cocobolo handles, fastened to the

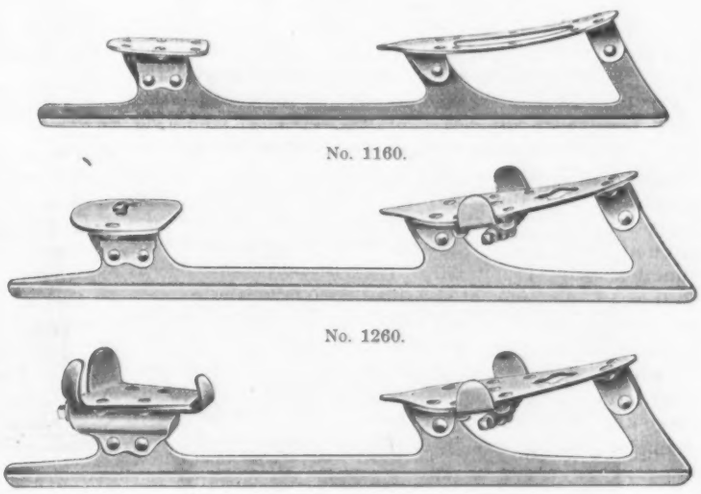
Butcher Knife, No. 400 Line.

tang with brass rivets and burs. The prices on these goods are given under Notes on Prices on a preceding page.

Winslow's Hockey Skates.

The Samuel Winslow Skate Mfg. Company, Worcester, Mass., are giving particular attention to hockey skates this year, the rib runner pattern being shown in the accompanying cuts. These have three different fastenings, are made in one grade only and on the lines of the Canadian hockey skates. The runners are the flanged model, which, it is explained, makes them light but strong. They are made of welded iron and steel, hardened and tempered, highly polished and warranted by the manufacturers. The parts of the skates are made of special cold rolled steel, with polished edges, while the entire skate is nickel plated and buffed throughout. Skates of this kind are made for women in all grades, when ordered, the toe plates of which are narrower and the heel plates smaller than on men's skates.

In this connection the company state that a skate



No. 1160.

No. 1260.

No. 1360.

Winslow's Hockey Skates.

blade with a rib on the bottom is lighter and stronger and that they make them on some styles of fancy and hockey besides those illustrated. The Winslow extension double runner skates are referred to as a skate educator for children and others just learning to skate.

A. O. Duncan has sold his stock of Hardware, Stoves and Farming Implements at St. Jose, Texas, to Dunbar & Johnson. The new owners sell strictly for cash, except in the Implement line, where well secured notes are accepted.

L. S. Starrett Company's New Tools.

The illustrations herewith represent part of a group of fine mechanical tools just put on the market by the L. S. Starrett Company, Athol, Mass., and 123 Liberty street, New York. Fig. 1 is a spacing center punch, No. 118, 4 inches long and 5-16 inch in diameter. It is a

Fig. 1.—Spacing Center Punch.

combination prick punch and spacing tool, designed particularly for laying off work quickly and accurately, especially for drilling, cutting out dies, &c. The prick punch is solid, made from best quality tool steel and properly tempered. The guide point is set in a socket with a spiral spring to press it down. When the punch is struck the guide recedes into its socket, thus permitting the punch to be held in a vertical position or at right angles with the work, insuring accurate results. The milled edge thumb screw with check nut sets the spacer right for small or large drill. The two points

Fig. 2.—Cross Test Level.

can be set as far apart as 7-16 inch. Fig. 2, cross test level No. 136, as the illustration indicates, shows two levels in one frame, extending at right angles 2¾ inches each way, with diameters of 9-16 inch to each arm. The level glasses have red hair line centers and the tool weighs but 4 ounces. When placed on work to be leveled in both directions it will not be necessary to move the tool. Fig. 3 illustrates slide rule caliper and circumference gauge No. 424. This gauge has a double function, being graduated to read the circumference as well as the diameter of the thing measured, the relation of circumference to diameter being shown by the graduations on upper corners of the rule, the capacity of which is 3½ inches, showing an equivalent circumference of about 11 inches. The jaws are 1 5-16 inches deep and will caliper a cylinder up to 2½ inches in diameter. The rule is graduated in thirty-seconds of an inch standard and sixteenths of an inch circumference measure. All corners of the tool are rounded smooth to make it fit to carry in the pocket and agreeable to handle. The circumference measure will assist in calculating how many feet a minute the cutting tool in a lathe is doing on any diameter within the scope of the gauge and so help to determine whether the tools should have a faster or slower speed. This is accomplished by taking the circumference indicated by the gauge, multiplying the result by the speed the lathe runs per minute, when the product will show the number of inches or feet the circumference is running and the tool cutting. When closed the tool is 5 inches long over all, the extreme length open being 8⅞ inches. The blued set screw, seen under the figure 5, is to maintain fixedly at a given point any diameter obtained.

Fig. 3.—Slide Rule Caliper and Circumference Gauge.

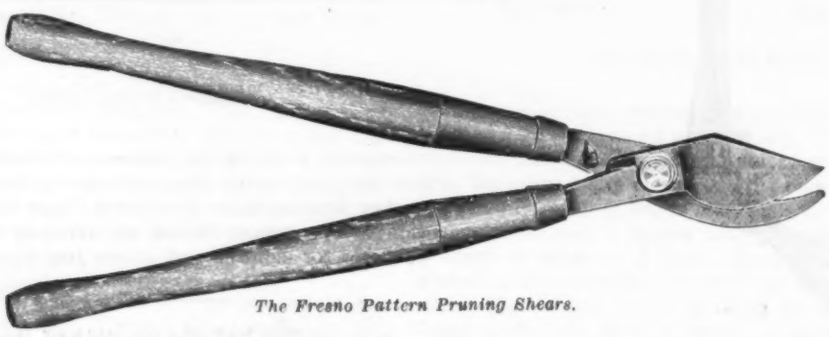
The Improved Henis Broiler.

The Royal Mfg. Company, 408 Commerce street, Philadelphia, Pa., are offering the improved broiler shown herewith. It is made of heavy sheet steel, having deep circular grooves in both sides of the broiler to retain the juices of the meat. The perforations are punched and upset so as to make it impossible for the juice to escape, and the meat, held firmly, is cooked in its own juice. It is explained that the nutritious juices are retained and conveyed back to the meats, in the self-basting process, by simply reversing the broiler a few times while broiling. The broiler is made in sizes Nos. 8 and 9 to fit the stove hole, and in use, it is explained, there is an absence of smoke and no soiling of stove or range.

The Improved Henis Broiler.

The Fresno Pattern Pruning Shears.

The pruning shears shown herewith are forged from high grade tool steel finely tempered and fitted with solid wrought steel ferrules. The shears are made in 20, 26 and 36 inch sizes, and are put on the market by the Cronk & Carrier Mfg. Company, Elmira, N. Y.



The Fresno Pattern Pruning Shears.